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VOLUME XII,  
NUMBER 12.

DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

DECEMBER, 1881.

NEW YORK:  
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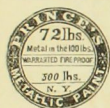
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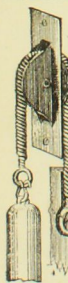
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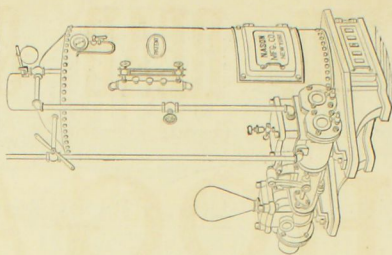
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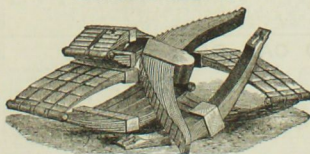
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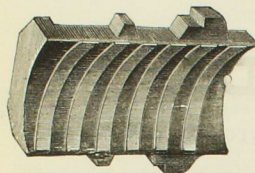
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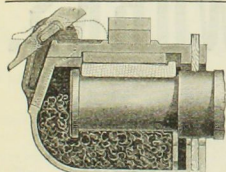
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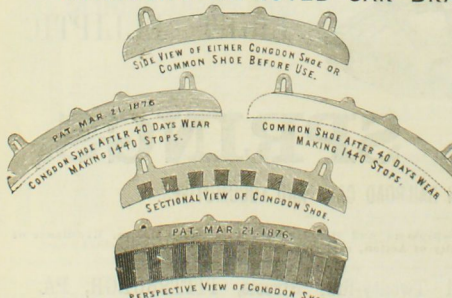
## THE HEWITT BOX-LID CO.,

142 DEARBORN STREET,

CHICAGO ILL.

We respectfully refer you to the following railroads using the Hewitt Cover  
K. C. SE. J. C. E. M. R. P. S. G. C. R. Q. C. A. S. L. J. A. T. S. F. A. A.  
N. E. T. F. A. P. M. D. L. S. N. D. E. R. C. M. C. H. S. J. C. V. S. L.  
I. M. S. S. D. E. M. B. D. N. S. D. P. L. L. & O. L. E. & W. L. P. A. C. L.  
I. C. O. C. S. L. V. & T. H. S. E. V. & S. C. N. Y. C. & E. I. M. P.

## CONGDON'S IMPROVED CAR BRAKE SHOE.



G. M. SARGENT, General Manager, Grand Pacific Hotel, Chicago, Ill.

This improvement consists of a shoe, having imbedded in its body of cast iron, pieces of wrought iron, steel, malleable iron, or other suitable metal, fixed therein so as to appear in sections on the wearing surface of the shoe, which increases surprisingly its resistance to wear, and adds materially to the friction or adhesion of the shoe to the surface of the wheel. These shoes are now in extensive and general use on many prominent railroads and are effecting a saving of over fifty per cent.

Communications should be addressed to either of the following parties: THE CONGDON BRAKE SHOE CO. GRAND PACIFIC HOTEL, CHICAGO; RAMAPO WHEEL & FOUNDRY CO., RAMAPO, N. Y.; J. H. BASS, CHICAGO; BASS FOUNDRY & MACHINE WORKS, PORT WAYNE, IND.; ST. LOUIS CAR WHEEL CO., ST. LOUIS, MO.

THE CONGDON Brake Shoe Co.

## CRANE BROTHERS MFG. CO.

Offices, No. 10 N. Jefferson St., Chicago.

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## WROUGHT IRON PIPE,

Brass and Iron Goods

For Steam and Gas Fitters and Engine Builders,

CAST IRON and MALLEABLE IRON FITTINGS

Steam Pumps, Injectors, &amp;c.,

Hollow Stay-Bolt Iron, Babbitt Metal, &amp;c.

MALLEABLE IRON CASTINGS,

GRATE BARS, &amp;c., &amp;c.

JOYCE, CRIDLAND &amp; CO.,

Cor. Wyandotte St. and Railroad.

DAYTON, O.

MANUFACTURERS OF

LEVER,

COMPOUND LEVER,

AND

Screw Jacks.

We make 37 varieties of these Jacks, and have more in process of construction. Send for Illustrated Catalogue and Price List.

## WINSLOW'S PATENT CAR ROOF



A. Carline or Main Rafter. B. Sub or under boarding. C. Asphalt Felt, and when on Car painted with Imperishable Asphalt paint. D. Felt Cap or Sub Rafter. E. Upper board roof. F. Sub Rafter. G. Stringers on Sub Rafter. H. Air Space between the Felt and upper board roof. This roof must come into general use by Railway Companies and Manufacturers of Stock and Freight Cars for two reasons, CHEAPNESS and DURABILITY; as it can be far more thoroughly protected by the upper and lower boarding, and the FELT, which is treated in its manufacture with ASPHALT and painted with the same imperishable material, which, not being affected by either heat or cold, must last the ordinary life of a car.

MANUFACTURED BY A. P. WINSLOW & CO., CLEVELAND, OHIO.



DECEMBER, 1881.

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machines,  
and in East, Albany, N. Y.  
day becoming more popular

ANY,

Harborn Street, Chicago.

ERS MFG. CO.

Jefferson St., Chicago.

IRON PIPE,

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MANUFACTURERS OF

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POUND LEVER,

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crew Jacks.

make 27 varieties of these  
and have them in process of  
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AR ROOF

low or under boarding. C As  
equipped with imperishable  
ly Rubber. E Upper board  
ry on Sills. Batten. H Air  
e board roof.

veral use by Railway Com-  
rks and Freight Cars for two  
e ABILITY, as it can be for  
a first-class double board  
e best metallic roof, being  
er and lower boarding, and  
manufactured with ASPHALT  
could, must meet the ordinary

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OHIO.

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OW & CO.,

OHIO.

DECEMBER, 1881.]

THE NATIONAL CAR-BUILDER.

iii

## LOWE'S METALLIC PAINT COMPANY, CHATTANOOGA, TENNESSEE,

MANUFACTURERS OF

# LOWE'S METALLIC PAINT!

This Paint has now been before the public sufficiently long to establish its qualities as first-class Metallic Paint in every respect. It has covering properties superior to any other Metallic Paint made.

**It takes about 18 per cent. less Oil than any other Metallic Paint.**

It is absolutely free from Sulphates of every kind and description, which in many other Metallic Paints prove so injurious to Iron and Tin Roofs. It is manufactured in a very superior manner by being re-ground and carefully prepared, and is entirely available for inside finish when dark colors are desired. Its natural color is a Uniform Dark Blood Red. It is

**Warranted not less than 55 per cent. Metallic Iron,**

thus giving it a body excelled by no other Paint made. Its Fire Proof properties are excellent, and houses constructed of wood, and especially shingle roofs, are very materially protected by application of this Paint. It is not calcined nor burnt, consequently its color is unchangeable. We have Freight arrangements to nearly every city in the United States and Canada, and would name Prices delivered. Please read the Certificates hereto attached.

East Tennessee, Virginia & Georgia Railroad—Main Stem—  
Office of General Superintendent,  
Knoxville, Tenn., April 18, 1881.

S. B. Lowe, Chattanooga, Tenn.:  
Dear Sir:— I will say that this company is using it both upon its Main Stem and Selma Division, and has found it perfectly satisfactory, and equal to any Lehigh Brown that we have used. It mixes well and spreads smoothly, and I find it much the cheapest paint that I can use for freight cars and such purposes.

Very truly yours,  
JNO. F. O'BRIEN, Gen'l Supt.

Wilkins, Post & Co., Engineers and Bridge Builders,  
Atlanta, Ga., and 102 Broadway, N. Y.,  
Atlanta, May 16, 1881.

S. B. Lowe, Chattanooga:  
Dear Sir:— We have been using your paint on all the iron bridges that we are constructing on the M. & C. Georgia Western, and other railroads through the South, and find it of very superior quality requiring less oil and working with ease, and having excellent covering properties.

Respectfully,  
WILKINS, POST & CO.

Office of Peaslee, Gaulbert & Co., Manufacturers of  
White Lead, Colors, Ready Mixed Paints, etc.,  
Louisville, Ky., April 15, 1881.

Low's Metallic Paint Co., Chattanooga, Tenn.:  
Dear Sir:— We have your Metallic Paint has given perfect satisfaction wherever we have placed it. In grinding we find it takes from ten to twenty-five per cent. less oil than various other brands of oxide of iron we have heretofore handled.

Very truly yours,  
PEASLEE, GAULBERT & CO.

King's Iron Bridge & Manufacturing Co.,  
Cleveland, O., May 22, 1881.

Low's Metallic Paint Co., Chattanooga, Tenn.:  
Gentlemen: We find your paint of first-rate quality for our use, and very economical. Yours truly,  
KING BRIDGE CO.

Office of Scott & Co.,  
Manufacturers of Scott's Sheet Iron Roofing,  
Cincinnati, May 4, 1881.

Low's Metallic Paint Co., Chattanooga, Tenn.:  
Gentlemen: We consider it as good as any that we have used during our experience of over nine years, and shall use it largely. Yours, etc.,  
SCOTT & CO.

W. G. Hyndman & Co.,  
Manufacturers of Patent Sheet Iron Roofing,  
Cincinnati, May 3, 1881.

Low's Metallic Paint Co., Chattanooga, Tenn.:  
Gentlemen: The paint which we received from you last month has given us perfect satisfaction. We regard it as the best iron ore paint that we have ever used.

Respectfully yours,  
W. G. HYNDMAN & CO.

P. S.— Please forward us immediately two (2) tons more on our order.  
Wason Car and Foundry Co.,  
Chattanooga, Tenn., May 3, 1881.

S. B. Lowe, City:  
Dear Sir:— For some time past we have been using the Lowe Metallic Paint upon all the cars built at our shops, and, as it gives entire satisfaction to our customers, it is our purpose to continue the use of it.

F. F. MORRILL, Sec'y.

Cincinnati, Hamilton & Dayton R. R. Co.,  
Operating the

Dayton & Michigan, Cin. to Richmond & Chicago,  
and C. H. & L. R. R.  
W. H. H. Allison, Master Car Builder,  
Cincinnati, June 14, 1881.

Low's Metallic Paint Co., Chattanooga, Tenn.:  
Gentlemen: We have been using your Metallic Paint on freight cars, at our shops, for the last four months, and find it a better paint than we ever used for that purpose.

Yours respectfully,  
W. H. H. ALLISON.

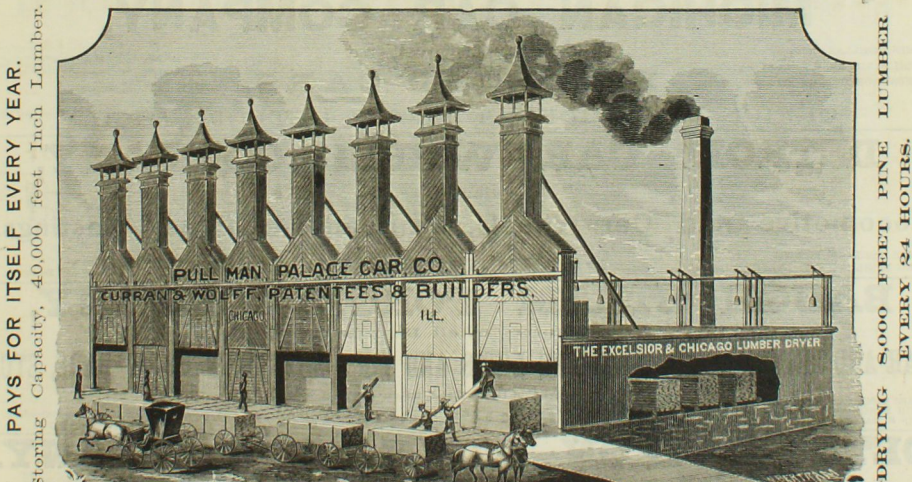
Laboratory of Fred P. Dewey,  
Chemist to Roane Iron Co.,  
Chattanooga, Tenn., April 9, 1881.

S. B. Lowe, Esq.:  
Dear Sir:— I have given samples of your paint ore a careful analysis with a special view of ascertaining if there is any substance in it calculated to prove injurious to tin or iron roofs, and am free to say that I find it remarkably free from sulphides of every kind, or anything else that could prove injurious to either tin or iron roofs. Yours respectfully,  
FRED P. DEWEY, Ph. B., Analytical Chemist

Office of Norton & Wiedner,  
Paints, Oils, Varnishes, Glazes, Sash, Doors and Blinds,  
St. Louis, May 30, 1881.

Low's Metallic Paint Co., Chattanooga, Tenn.:  
Gentlemen: We have used and sold—in the course of the past year—enormous quantities of your Metallic Paint, and we find that less oil is required for yours than for other Metallic Paints. Yours truly,  
NORTON & WIEDER.

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Wells & French Co., Chicago..... 3	Ohio Pain Car Company, Jeffersonville, Ind..... 2
C. & N. W. Railroad, Chicago..... 3	Indiana Car Company, Cambridge City, Ind..... 1
Flint & Pere Marquette R. R., Saginaw..... 1	Haskell & Barker Company, Michigan City, Ind..... 1
Pennsylvania Car Works, Detroit..... 1	Denver & Rio Grande Railway, Denver, Colo..... 2
Michigan Car Company, Chicago..... 1	

CURRAN & WOLFF, Proprietors and Builders, 39 and 41 FRANKLIN STREET, CHICAGO, ILL.



**WASON CAR & FOUNDRY CO.,**

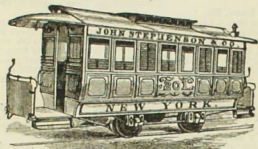
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CAR WHEELS,  
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**GILL CAR**  
M'F'G CO.,  
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Make the best CARS and WHEELS.

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Manufacturers of all kinds of Passenger and Freight Equipment, both Wide and Narrow Gauge.

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Especially attention is given to furnishing Hoisting Engines, Pit Cars, Dumps, etc., etc., for Coal Mines, as well as building Stationary Engines and Boilers, and General Brass and Sheet-Iron Work.

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Mail, Baggage, Box, Gondola, Flat, Gravel, Ore, Coal, Mine and Hand Cars,  
Kelley's Patent Turn-Tables and Centres for Wooden Turn-Tables,  
Car Castings, Railroad Forgings, Rolling-Mill Castings,  
Bridge Bolts and Castings.

We have in connection with our Car Works an extensive Foundry and Machine Shop, and are prepared to do a general Machine Business.  
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LAKE SUPERIOR CHARCOAL PIG IRON,

FOR CAR-WHEEL AND MALLEABLE USE.

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[DECEMBER, 1881.]

(LIMITED.)

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etc., etc., for Coal Mines, as well as

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Mine and Hand Cars,

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THE NATIONAL CAR-BUILDER.

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MICHAEL SCHALL & ARTHUR KING, Proprietors,

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## RAILWAY AND MINE CARS.

SPECIAL ATTENTION GIVEN TO CAR REPAIRS.

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## LEHIGH CAR, WHEEL & AXLE WORKS,

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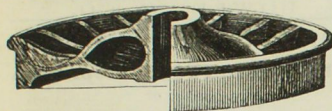
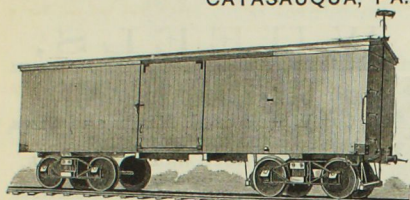
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Broad and Narrow-Gauge  
FREIGHT AND COAL CARS  
OF EVERY DESCRIPTION.

WHEELS  
For Freight, Locomotive,  
Truck, Tender, and  
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Hammered Axles,  
AND OTHER FORGINGS.

CAPACITY:  
16 Box-Cars Per Day.  
250 Wheels Per Day.

Wheels Fitted to Axles, and Prices  
Furnished on Application.



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Manufacturer of Steel Barbed Fence Wire, Staples, &c.

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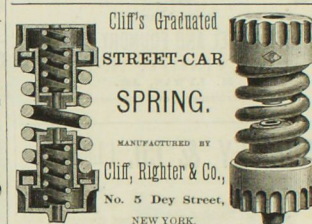
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Our Cars have all Late and Valuable Improvements. Are  
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Lightness and Strength with Beauty in Design and Finish.  
Our large Facilities Enable us to Fill Orders Quickly and at  
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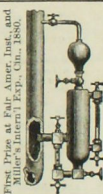
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For oiling valves and cylinders  
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Through the Steam Pipe.

The oil passes in sight, drop by  
drop, into the column of steam,  
where it vaporizes, thus becom-  
ing a steam lubricant, oiling per-  
fectly every part reached by  
the steam. Any clean oil, black  
or white, light or heavy, may  
be used. Saves from 50 to 60  
per cent. in oil and wear of ma-  
chinery, thus paying for itself  
several times a year. A cup  
will be sent to responsible par-  
ties on 20 days' trial if desired.  
In ordering give diameter of  
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trolled by us. Lu-  
bricators of every  
nature embodying  
the above feature,  
made by other par-  
ties, are encroach-  
ments upon our  
rights, and we will  
against the American Lubri-  
cator Co. of Detroit, before Justice  
and users, as well  
as manufacturers.  
Supreme Court, involving their  
responsible in "sight feed" feature, a decree  
damages for such was rendered in our favor Aug.  
20, 1881.

DETROIT  
LUBRICATOR MFG. CO.

Office, 89 Griswold St.,  
DETROIT, MICH.

NOTE.—In our recent suit  
against the American Lubri-  
cator Co. of Detroit, before Justice  
and users, as well  
as manufacturers.  
Supreme Court, involving their  
responsible in "sight feed" feature, a decree  
damages for such was rendered in our favor Aug.  
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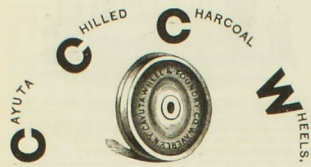


L. H. TAYLOR, Pres.  
S. P. RAHER, Sup't. J. H. WALKER, Sec. and Treas.



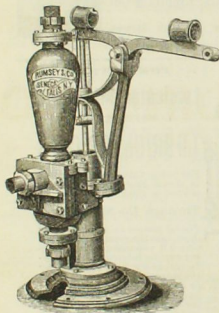
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MANUFACTURERS OF  
Chilled Iron Car-Wheels, Steel-Tired Wheels, Car  
and Locomotive Axles and Draw Hooks.



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**CAYUTA WHEEL AND FOUNDRY COMPANY,**  
Waverly, N. Y.  
M. LYMAN, JR.  
Superintendent and Treasurer

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NEW YORK,  
Manufacturers of  
OVER 800 DIFF-  
ERENT STYLES  
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More than 50  
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panies have them  
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FIRE ENGINES,  
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ASK FOR  
RUMSEY'S  
PUMPS

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full information.

RUMSEY & CO.,  
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## HOWARD IRON WORKS, BUFFALO, N. Y.,

MANUFACTURERS OF  
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And Nut Tapping Machine,  
SPECIALLY ADAPTED FOR R.R. WORK.



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Sole Manufacturers of  
**EUREKA**  
Post Hole Digger.  
REDUCED PRICE, \$3.

LIBERAL DISCOUNT TO THE TRADE. A valua-  
ble tool for nurserymen and well-diggers.  
Send for circular.

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Manufacturers of CAR WHEELS of all descriptions.  
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L. A. GREEN, Sup't, Cincinnati, O.

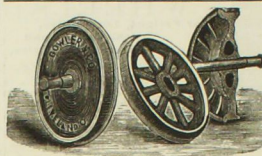
## DAVENPORT, FAIRBAIRN & CO.,

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MANUFACTURERS OF

## CAR WHEELS,

Capacity 500 Wheels per day. Wheels made by improved process. Far more durable than those made in the ordinary way



## CLEVELAND FOUNDRY,

Car Wheels of all Kinds and Sizes,  
WITH OR WITHOUT AXLES.

CHILLED-FACED RAILROAD FROGS.

Street Railroad Turnouts.

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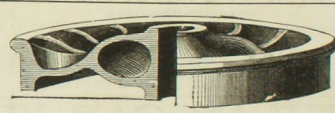
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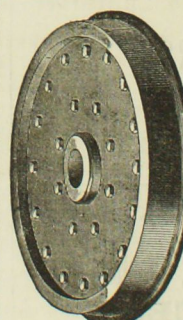
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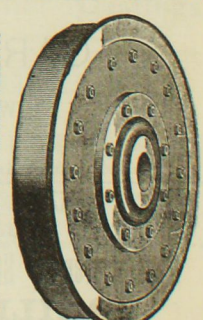
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[DECEMBER, 1881]

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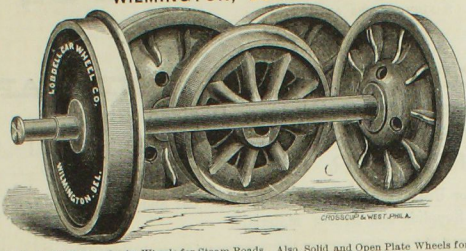
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DECEMBER, 1881.]

# THE NATIONAL CAR-BUILDER.

vii

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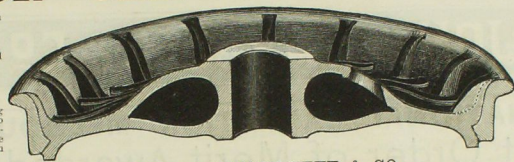
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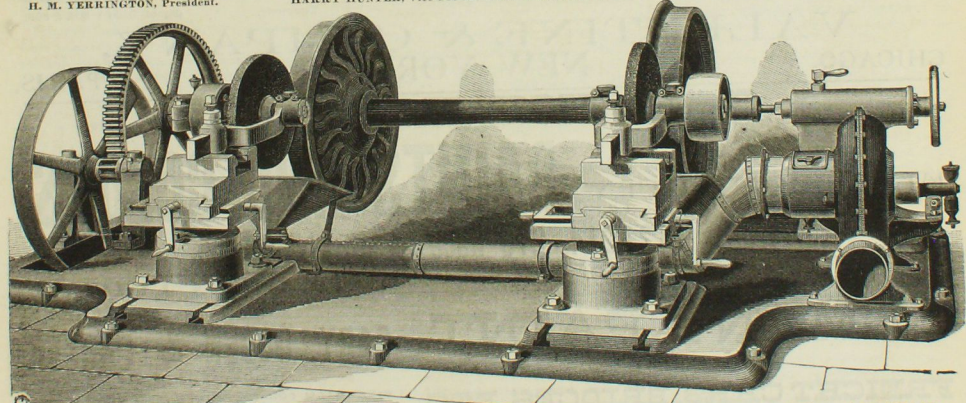
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Yours truly,

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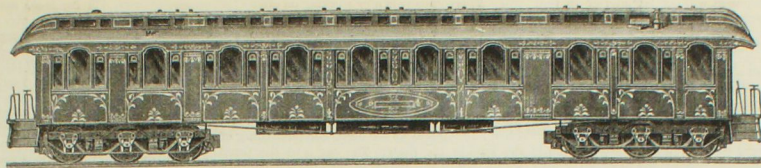
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**RAILWAY VARNISHES**



# THE NATIONAL CAR-BUILDER.



DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

VOLUME XII  
NUMBER 12

DECEMBER, 1881.

SINGLE NUMBERS, TEN CENTS,  
\$1.00 PER ANNUM.

## Miscellaneous Items.

The car works of Pardee, Snyder & Co., at Watertown, Pa., are full of work.

The Elkhart (Ind.) Car Works are nearly completed. Their capacity will be twelve freight cars a day.

Two thousand additional freight cars have been ordered by the East Tennessee, Virginia & Georgia Railroad Company.

The Harrisburg Car Works, at Harrisburg, Pa., have orders for over 1,000 cars to fill, and are about closing another heavy contract.

A new car company is about to be organized at Canton, Ohio, for the building of freight cars. It will be known as the Canton Car Co.

The Seymour & Sabin Mfg. Co., Stillwater, Minn., have an order for 350 flat cars from the Chicago, St. Paul, Minn. & Omaha road.

The Shaw double-cylinder locomotive, which has been on the Boston & Providence road, has been taken to the Camden & Atlantic road, where it is to have an extended trial.

TEN superb new postal cars are in course of construction at the shops of the Lake Shore road, six of them at Adrian, and four at Buffalo. They are intended to be models of their class.

The New York Central fast train, while on the Lake Shore road a few days ago, made up 48 minutes lost time by running 135 miles in 160 minutes. The train consisted of five heavy cars.

The Peninsular Car Works, of Detroit, are building for the Chicago & Northwestern, 250 20-ton coal cars 32 feet long. The sides are 28 inches high, and the ends are hinged so the cars can carry lumber.

The Brotherhood of Locomotive Engineers have at present 191 "divisions" and 2,654 members. During the last 12 months 34 claims have been paid, amounting to \$77,814.78; and the total amount paid to widows and orphans since the establishment of the association is \$1,178,888.33.

The New York, Chicago & St. Louis Railroad Company has contracted with the Pullman Palace Car Company to build 100 passenger and baggage cars of a special and novel design. It is claimed that the passenger coaches will be the most elegant ever constructed.

The Continuous Draw-Bar Co., of Philadelphia, has bought the Salvador draw-bar, and now owns the two Middleton patents and the Hoyt, Caum and Griffith & Patterson patents, having thus, as it claims, control of all the legitimate continuous draw-bar patents in the United States.

A reorganization of the Barney & Smith Manufacturing Company, of Dayton, O., has been effected, and the officers are now as follows: E. J. Barney, President; J. D. Platt, Vice-President and Treasurer; F. E. Smith, Secretary; T. A. Bissell, Superintendent; Edward E. Barney, Assistant Superintendent.

The Pennsylvania Railroad Company, after a trial of four years on most, if not all, the divisions of their road, have decided to adopt the "Ashto noiseless blow back safety valve," and have ordered 500 sets, with fittings complete, to be shipped to Altoona.

The Chicago, Rock Island & Pacific road is building at Chicago 3 Horton chair cars. They have 31 chairs in the main room and 7 seats in the smoking room. The inside finish is in cherry, crotch mahogany and oak, the ceilings are paneled with oak and mahogany, and saloons and toilet rooms finished in Pullman style.

The Wells & French Co., Chicago, are building two derrick cars for the St. Paul, Minneapolis & Manitoba; six cabooses for the Atlantic & Pacific; 400 box, 100 coal and 100 stock cars, in addition to the 700 previously noted, for the Atchison, Topeka & Santa Fe; 25 box and 250 coal cars for the Mexican Central, and 250 coal cars for the C., B. & Q.

Moore's Perfected Railway Track Layer is one of the features of Western railway progress. The demand for it is increasing, and it is highly commended by all who have given it a practical trial. It is in use on the Chicago & Alton, Chicago & Northwestern, and a large number of other roads, Bradford & Moore, of Chicago, are the proprietors.

The Chicago, Milwaukee & St. Paul R. R. Co. employs 13,340 men, to whom it pays in the aggregate \$7,180,853.46, which is an average of \$542.35 salary to each. Its equipment of rolling stock is 470 locomotives, 187 passenger, 140 baggage, mail and express, 25 parlor and sleeping, 15,720 freight, and 236 other cars, making a total of 16,308 cars each.

MR. JOHN P. LEVAN, General Foreman of the Pennsylvania R. R. car shops, at Altoona, celebrated the 30th anniversary of his connection with the road on the 18th Nov. He was the first apprentice indentured to the company when the shops were removed to Altoona in 1852. Ten years later he was appointed foreman, with 98 men employed in the shops. Now the number is 1,635. In 1862 there were 69 passenger cars, but the number now runs up to 620.

In house painting, graining in imitation of wood or marble is to be condemned, on the ground that all shams are despicable. Besides, the result achieved is less pleasurable as an object to look upon than would be the natural wood, however common its quality, if it were properly filled and oiled. Shams of all kinds are to be avoided, and as graining, however little it may succeed in its aim, is intended to deceive, it is a sham, and therefore should never be countenanced by persons of taste.

A new car wheel is being made at the Allston (Mass.) Wheel Works, which will soon be tested on the Boston & Albany road. It is 42 inches in diameter, with nine solid wrought-iron double

spokes; the hub is nine inches in diameter and seven inches thick, and the rim, two inches thick, is welded to the spokes. The tire is of solid cast steel, five inches broad, the slope is one in twenty, and the flange is one inch high in sections, formed with curves of one inch radius. The double spokes give the needed elasticity, and the steel tire is expected to run 200,000 miles before turning is necessary.

A new style of car is about to be introduced on the Southern Pacific road, designed to be run from California to the Gulf as wheat cars, and on their return as emigrant cars. The interior will be like other freight cars. Along the sides will be sleeping bunks, lowered and suspended by an iron rod and hinge, but capable of being closed up flush when freight is carried. There are windows, of course; and it is said the cars will be as comfortable and warm as the most luxurious Pullman sleeping car ever turned out! Then why not call 'em Pullman palace emigrant sleeping freight cars?

The Union Pacific is building at Green Island, Neb., a car shop 300x350 ft., a wood-working shop 100x250, a paint shop 100x300, a locomotive machine shop 100x150, and a blacksmith shop with 48 fires. The buildings are of stone, with slate roofs, and are contracted to be finished by the first of January next. The road has recently ordered of the Pullman Co. six passenger cars for the Julesburg short line to Denver, and six for the main line.

MR. JOHN HILL, Master Car-BUILDER at the St. Paul shops of the St. Paul & Duluth road, has just completed 50 33-ft. flat cars. The end braces of his box cars run from center of end sills to ends of plates. The sills are extra heavy (7x8½ in.). His diamond trucks have a wheel base of 5½ and 6 feet, and strong check-chains at each corner. The top arch bar is ½x3½, the bottom one, which he thinks carries the load, is 1¼x3½. The clearance between transoms for truck bolster is 12½ inches.

MR. J. H. F. WIERS, formerly general master car-builder of the New York, Pennsylvania & Ohio road, and since the 1st of January last manager of the Pullman Car Works at Chicago, has resigned the latter position to accept the positions of superintendent of motive power and purchasing agent of the Toledo, Delphos & Burlington road, with headquarters at Toledo, Ohio. His resignation of the management of the Pullman Works, for which his ability and experience eminently qualified him, was much regretted by the company.

The Rochester & Pittsburg road (formerly Rochester & State Line) is being very much improved under the new management. New rails and ties have been added to the track, new engines and cars purchased, and the old rolling stock thoroughly repaired. New construction and repair shops are under way at the Rochester terminus, and nearly completed. They will be provided with the best of machinery. The company intend to put on drawing room cars, so that the



passenger equipment will not be inferior to that of the best roads.

The C., B. & Q. road is building at the Galesburg shops a mail car with body 55 ft. 6 in. long, 9 ft. 4 in. wide, and 6 ft. 8 in. high above sills; also a number of way cars 44 ft. long and 9 ft. 2 in. wide in the body. The latter are for local freight trains on the branch lines, and have in one end regular seats for 33 passengers, also a clear-story like ordinary passenger coaches, in one end of which is the lookout from the conductor's room. The road is also building a lot of regular way cars with bodies 28 ft. 4 in. long and containing four berth sections.

The locomotive of the Chicago, Rock Island & Pacific road, referred to in the CAR-BUILDER for September, page 119, as having an arched crown-sheet braced with stay-bolts instead of crown-bars, has been running some time, and works so well that the road has commenced building at its Chicago shops 14 more with the same style of boiler. Eight of them are four-wheel switching ponies with 15×24 cylinders, and tanks on top of boilers holding 110 gallons—total weight 30 tons. The remaining six are eight-wheel freight engines with 17×24 cylinders and 57-in. drivers—total weight 38 tons. These shops are also building three locomotive boilers, to be used in the suburban town of Lake.

The Chicago, Milwaukee & St. Paul road, in absorbing the Chicago, Clinton, Dubuque & Minnesota, acquired some fine shop buildings at Dubuque, Ia., which have been completely fitted up, and will be the principal division shops west of the Mississippi. About 450 men are now employed in them. Besides current repairs and rebuilding, the shops turn out four or five freight cars a week. The locomotive shops are very busy with general repairs and the rebuilding of nine engines. Among the new things originating here are a locomotive bell-ringer, an iron truck made without channel iron and having no spring-plank, and an excellent pump for supplying water to tanks and stationary boilers. The pump is simple and economical in construction and works nicely.

The shops of the Wisconsin Central road at Stevens Point, Wis., have been enlarged this season by the erection of new buildings and additions to the old ones, and now comprise a wood building for stores 35×75 ft., a stone round house of 15 stalls, a stone oil house 18×25 ft. inside, a brick machine and car shop 120×190 ft., with a wing for the engine and boiler rooms, a brick paint shop 80×140 ft., and a brick blacksmith shop 40×120 ft., with twelve forges and room for three more. The oil is stored in the cellar of the oil house in two 3,000 gallon and nine 1,000 gallon tanks. The floor over these is iron laid on old rails for joists. The oil is drawn by pumps on the floor, one over each tank. The transfer pit is 60×225 ft., and there is a turn-table beside it at the end of the paint shop and opposite the machine shop. At present about 100 men are employed in the shops.

The Allen Paper Car Wheel Company have turned out of their Hudson works during the ten months ending Nov. 1, 1881, 7,729 wheels. They are still adding to their machinery, and hope to increase the output at Hudson to 10,000 wheels the coming year. They are also pushing forward their improvements at the Chicago works as rapidly as machinery can be procured. When fully completed, these works are expected to have double the capacity of those at Hudson. The extensive paper mill, lately erected by this company at Morris, Ill., is very nearly ready for operation, and is expected to be running by the 1st of January. It will have a capacity of from 4,000 to 5,000 tons a

year. This company is now working on orders for the Mexican companies, the Atlantic & Pacific, the Central of New Jersey, Delaware, Lackawanna & Western, Delaware & Hudson Canal Company, Lehigh Valley, and the Atchison, Topeka & Santa Fe.

A PAY CAR is in course of construction at the Lehigh Valley Railroad shops, at Packerton, and when finished will be the most complete thing of the kind in the State. The car is of the usual length, width and height of an ordinary baggage car, and will be divided into four apartments—a cash, sleeping, cook room and observation room. In the cash or pay room will be placed sofas, tables, chairs and a Herring safe. The sleeping room will contain four berths. The cook room will be supplied with a cook stove and a patent Baker heater, a closet for dishes and one for linen. The observation room will be furnished with easy chairs and lounges. The interior of the car will be finished in black walnut and maple and neatly carpeted, and when completed will be a small railroad palace. The Paymaster and his crew will sleep and live on the car during the few days required to pay the men employed on all the branches of the road.

The annual report on the internal commerce of the United States, by Joseph Nimmo, Jr., chief of the Bureau of Statistics, contains the following statement in regard to the freight transportation on 13 leading railroads in 1873 and 1880. During this interval of seven years, the tonnage increased from 45,557,002 to 78,150,913 tons, or 71.5 per cent. The receipts increased during the same period from \$12,004,648 to \$148,388,178, or only about 28 per cent. The small increase of receipts, in proportion to the increase of traffic, is due to the fact that the average rate per ton charged on these roads fell from 1.77 cents per ton per mile in 1873, to 1.07 cents in 1880, being a decrease of 39.5 per cent. The aggregate traffic on the New York Central, Erie and Pennsylvania lines was more than three times as great in 1880 as in 1868, and after making a proper allowance for currency values in 1868, the average freight charges in 1880 were 60 per cent. less than in 1868.

The car shops of the Michigan Central road, at Detroit, have plenty of room inside, as well as abundant yard room. Their shop for general repairs is two-thirds of a circle, with a turn-table in the center. It has 26 tracks, each of which will hold two freight cars. The shops are running full time and employ 300 men. After dark they are lighted with 18 Brush electric lamps. Their month's repairs are about 15 coaches, baggage, mail and express cars and 130 freight cars. They are building 8 way cars and 3 combination, baggage, mail and express cars; 6 of the way cars have bodies 40 ft. long and 8 ft. wide, with special trucks modeled after the road's passenger trucks; 2 way cars which are only 24 ft. long are designed for special service between the Kensington freight yards and Chicago, a distance of 14 miles. The combination cars are 48 ft. long and 10 ft. wide, with the mail room in the center. The Michigan Car Co. have just finished 400 flat cars and 850 box cars for this road.

The report of the State Engineer on the railroads of the State of New York for the year ending Sept. 30, 1880, gives a total mileage of steam roads owned at 8,709 miles; length of main line, 6,571 miles, and length of branches, 2,625 miles, making an aggregate of 13,583 miles, including additional track and sidings on main line and branches. The length of main line and branches within the limits of the State is 5,970 miles and track laid within such limits, 9,305 miles. The equipment consisted of 3,398 engines, 2,918 first-class passenger cars, 525 second-class and emigrant

passenger cars, 770 baggage, mail and express cars, 85,796 freight and other cars, a noticeable increase as compared with the preceding year. The total number of passengers carried on the steam and elevated roads was 109,029,142, an increase, as compared with the previous year, of 21,351,721. The casualties consisted of 11 passengers, 137 employees and 239 other persons killed, and 104 passengers, 508 employees and 235 other persons injured, a total of 377 killed and 847 injured. As compared with the previous year this shows a decrease of 32 killed and an increase of 21 injured.

The car shops of the Illinois Central, at Chicago, are building three smoking cars and one coach for suburban traffic. The bodies are 45 ft. long, 8½ ft. wide, and seat 54 passengers. They are also building two coaches for the main line with bodies 48 ft. long and 9 ft. 8 in. wide. They will have four-wheeled trucks, with a wheel base of 7 ft., having brakes hung inside, which, it is thought, makes the cars ride steadier when the brakes are being applied. They will have a saloon and lavatory in one corner, and a Searles heater opposite. The rest of each car will be occupied with seats for 58 passengers; the seat ends are the road's standard iron pattern. They will have decorated oak ceilings and mahogany moldings. The shops are also building 140 freight cars to replace old cars, and rebuilding two sleepers, with smoking room at one end, and clear-stories extended so as to get ventilation from the hood; also 500 trucks for the Chicago, St. Louis & New Orleans road shops at McComb City and Water Valley, Miss., where the bodies for them are being built at the rate of eight per day.

THE MICHIGAN CAR COMPANY is working a full force of over 2,000 men. The short days are lengthened, by using three Weston electric light machines, which supply 30 burners distributed through the shops, so as to work part of the force until 8:30 in the evening. The operations are very thoroughly systematized, each set of men being kept at the same kind of work. The undressed lumber goes into one end of the wood shop, moving always forward and never backward, through the successive processes of planing, sawing, tenoning, mortising, etc., until it is delivered at the other end to the erecting shop, where it passes from one gang of men to another until the entire material for a car is assembled, put together, painted and lettered, ready for examination by the company's inspector before the car is delivered for shipment. Over 90 per cent. of the cars built have the M. C. B. standard axes, boxes and brasses, and the percentage increases every year. Besides rebuilding and repairing an average of 20 cars a day, from 20 to 25 new ones are turned out. The company have contracts in hand for over 3,500 cars, including 50 coal cars for the Chicago & Grand Trunk, with yellow sides and red ends; 200 Millis double-deck stock cars for John P. Squire & Co.'s Boston Live Stock Line, painted a bright green; 100 refrigerator cars (Chase's patent) for George Swift's New England Fresh Meat Line Express of Chicago; 100 refrigerator cars (Davis' patent) for G. H. Hammond & Co., of Detroit; 1,000 box cars, 250 to be 25 ft. and 750 to be 33 ft. long, for the Grand Trunk Railway; 300 flat, 300 box, and 400 stock cars for the C., B. & Q. road; and 1,000 box cars for the Chicago, Milwaukee & St. Paul. The works have 8 axle-turning machines, a steam drop for forming arch-bars, iron transoms, carryings, swing-hangers, etc., and machinery is being put in for running the foundry cranes by steam.

Of the 291 axles which failed on English railways the first half of this year, 149 were engine axles, viz.: 138 crank or driving, and 11 leading or trailing, 23 were tender axles, 109 were wagon axles and 10 were axles of salt vans. Of the 138 crank or driving axles, 87 were made of iron and



ago, mail and express cars, a noticeable increase over the preceding year. The cars carried on the steam line, 142, an increase, as is year, of 21,351,721. 1 passengers, 127 cars killed, and 104 passengers other persons injured and 847 injured. This year this shows an increase of 21 injured.

Central, at Chicago, cars and one coach for cars are 45 ft. long, 8 1/2 ft. wide. They are also on main line with bodies wide. They will have a wheel base of 7 ft., which, it is thought, when the brakes are used, a saloon and luxurious heater opposite. The cars are occupied with seats at ends are the road ends will have decorated moldings. The shops at cars to replace old lepers, with smoking stories extended so as to hood; also 500 trucks and 100 cars on the Water Valley, if so, are being built at the

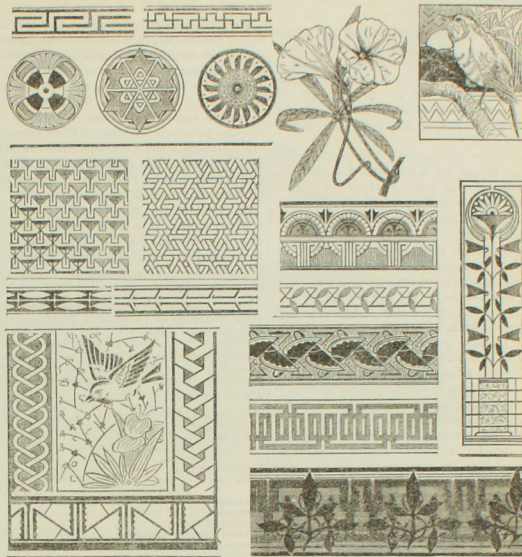
FANSY is working a full The short days are Western electric light 10 burners distributed work part of the force The operations are very each set of men being work. The undressed of the wood shop, moreover backward, through planing, sawing, tenoning it is delivered at the shop, where it passes under until the entire assembled, put together, for examination by the car is delivered for it. of the cars built have boxes and leases, and very year. Besides revenue of 20 cars a day, turned out. The cost for over 3,500 cars, the Chicago & Grand and red ends; 200 Mills John P. Squire & Co. painted a bright green; use's patent for George h Meat Line Express, of cars (Davis' patent) for Detroit; 1,000 box cars, be 30 ft. long, for the flat, 300 box, and 400 Q. road; and 1,000 box trucks & St. Paul. The machines, a steam drop on transoms, carrying machinery is being used cranes by steam.

is failed on English rail- is year, 140 were engine driving and 11 leading or axles, 109 were wagon of salt vans. Of the 128 were made of iron and

51 of steel. The average mileage of 80 iron axles was 181,988 miles, and of 47 steel axles 172,328 miles. Of the 381 rails which broke, 307 were double-headed, 71 were single-headed, 1 was of the bridge pattern and 2 were of the Vignoles' section; of the double-headed rails, 221 had been turned; 221 rails were made of iron and 100 of steel. Of the 780 tires which failed on the railways of the United Kingdom during the six months ending June 30 last, 47 were engine tires, 35 were tender tires, 5 were carriage tires, 35 were van tires and 670 were wagon tires; of the wagons, 551 belonged to owners other than the railway companies; 581 tires were made of iron and 100 of steel; 28 of the tires were fastened to their wheels by Gibson's patent method, 18 by Beattie's patent, 10 by Mansell's patent, and 27 by Drummond's patent, all of which remained on their wheels when they failed; 682 tires were fastened to their wheels by bolts or rivets, of which 5 left their wheels when they failed, and 15 tires were secured to their wheels by various other methods, none of which left their wheels; 100 tires broke at rivet holes, 195 in the solid, 2 at the weld, and 474 split longitudinally or bulged.

SOME very heavy orders for cars have recently been given for the Vanderbilt roads. These include 2,080 for the New York Central & Hudson River, as follows: 400 box cars 34 ft. long, to go into the Blue Line; 1,030 box cars 29 ft. long, of which 300 are for the Blue line, 230 for the White Line, 230 for the Midland Line and 350 for general use on the road; 250 four-wheel box cars for local traffic; 300 rack lumber cars, 34 ft. long, and 100 double-deck stock cars, 34 ft. long. The Lake Shore & Michigan Southern order is for 1,300 cars, 1,050 to be box cars 34 ft. long, and 250 box cars 29 ft. long, 170 of the latter being for the White Line and 80 for the Red Line. These 3,380 cars will be divided between the Harrisburg Car Co., at Harrisburg, Pa., and the Jackson & Woodin Manufacturing Co., at Berwick, Pa. A further order has been agreed on for 300 refrigerator and 2,000 box cars for the Merchants' Dispatch. Orders have been given that these cars—and all others to be built hereafter for the Vanderbilt roads—shall be made to the New York Central standard drawings and specifications.—*Railroad Gazette.*

THE financial strength and restless enterprise of our leading capitalists are strikingly shown by the noiseless progress which is making in the construction of new trunk lines of railway between the Atlantic seaboard and Chicago. There are no less than six of these, to be completed within the next two years, at an expenditure of something like \$65,000,000, most of which has already been secured by private subscription. It is not unlikely that the so-called "railroad wars" have been instigated to some extent by a desire to discourage the prosecution of these works. If so they have failed. Three of the lines referred to will have their terminus at Jersey City, viz: The New York, West Shore & Buffalo, ending near the tunnel at Weehawken, with branches from Athens and Cornwall; the New York, Lackawanna & Western, and the New York, Pittsburgh & Chicago, the last mentioned including the Central New Jersey and its connections in Pennsylvania. In addition we have the New York, Chicago & St. Louis, the Chicago & Atlantic, and the Boston, Hoosac Tunnel & Western, all of which are being made complete by supplying intermediate sections, or missing links. If we bear in mind the embarrassments of the past few months, arising from inadequate means of transportation—the "freight blockade"—and the chronic complaint of a lack of cars—it will be seen that the capitalists who are now seeking profitable investment, as above described, have moved none too soon.—*From Age.*



SPECIMEN DESIGNS FOR DECORATIVE WORK.

THE cuts represent specimens of decorative designs from a collection in portfolio form just issued by Mr. J. O'Kane, 4 College place, New York, and comprising 24 folio tinted plates, embracing several hundred carefully prepared designs suitable for ceilings, panels, and other kinds of surface work in the interior finish of railway cars. The collection is especially rich in borders and edgings, and will be found very useful, not only on account of the variety it contains, but for the originality and excellence of the designs. The specimens herewith presented are reduced from the plates, but they fairly represent the style and character of the collection.

#### Polishing Wood.

Turned articles must be brought to a fine smooth surface with the finest sandpaper, and the direction of the motion should be occasionally reversed, so that the fibers which are laid down by rubbing one way may be raised up and cut off. To apply the polish, which is merely a solution of shellac in alcohol, take three or four thicknesses of linen rag, and place a few drops of polish in the center; lay over this a single thickness of linen rag and a drop or two of raw linseed oil over the polish. The rubber is then applied with light friction over the entire surface of the work, while revolving in the lathe, never allowing the hand or mandrel to remain still for an instant, so as to spread the varnish as evenly as possible, especially at the commencement, and paying particular attention to the internal angles, so as to prevent either deficiency or excess of varnish at those parts. The oil in some degree retards the evaporation of the spirit from the varnish, and allows time for the process; it also presents a smooth surface and

lessens the friction against the tender gum. When the varnish appears dry, a second, third and even further quantities are applied in the same manner, working, of course, more particularly upon those parts at all slighted in the earlier steps.

Flat surfaces are polished in a similar manner. The wood must be filled, as it is called, and for this nothing is better than whiting, colored so as to resemble the wood and kept dry. Rub the latter well with linseed oil, and then sprinkle it with whiting. Rub the latter well in, wipe it off carefully, and give time to dry. This is far superior to size.

The polisher, however, generally consists of a wad of list, rolled spirally, tied with twine and covered with a few thicknesses of linen rag. Apply a little varnish to the middle of the rubber, and then inclose the latter in a soft linen rag, folded twice. Moisten the face of the linen with a little raw linseed oil, applied to the middle of it by means of the finger. Pass the rubber quickly and lightly over the surface of the work in small circular strokes, until the varnish becomes nearly dry; charge the rubber with varnish again, and repeat the rubbing till three coats are laid on, when a little oil may be applied to the rubber and two more coats given it. Proceed in this way until the varnish has acquired some thickness; then wet the inside of the linen cloth, before applying the varnish, with alcohol and rub quickly, lightly and uniformly the whole surface. Lastly, wet the linen cloth with a little oil and alcohol, without varnish, and rub as before till dry. Each coat is to be rubbed until the rag appears dry, and too much varnish must not be put on the rag at one time. Be also very particular to have the rags clean, as the polish depends in a great degree upon keeping everything free from dust and dirt.—*Exchange.*



### The Car-Builders' Monthly Meetings—Cast-Iron Car Wheels.

A preliminary meeting was held at the rooms of the Association, 113 Liberty street, New York, on the evening of Nov. 17, for the purpose of designating a subject for discussion at the December meeting, which will be the first one of the regular series to be held on the third Thursday of each month until April, as has been the practice heretofore.

The subject for this meeting will be, *Cast-Iron Chilled Car Wheels for Twenty-ton Freight Cars*, to be considered with reference to uniformity in their dimensions, including diameter, a true circumference, width of tread, the expediency of coning, weight, etc.

The importance of this subject can scarcely be underrated by any one who has anything to do with the management and maintenance of freight cars. It also has an equal interest for wheel-makers. It is well known that within the past ten years iron wheels have been very greatly improved in quality, as shown in their average mileage, and this with an increasing weight of load. There can be no question but this improvement has been largely due to the discussions of the subject at these monthly meetings, in which the manufacturers and users of wheels have participated. The improvement, however, has been mainly in securing a better service by the use of better material, or by a better use of the same material. There are other things of almost equal importance that enter into the economy of wheel service, and these are precision and uniformity of dimension, balancing, coning, etc.—whatever, in fact, tends to make the structure mechanically complete. When the makers of wheels are so numerous, there will necessarily be diversity in the product, more or less, and the object of discussion is to arrive at a more precise knowledge of existing defects, and as far as practicable apply the remedy. It is a subject which concerns both car-builders and wheel-makers, and it is extremely desirable that as many of them as possible be present at the meeting. Those who are unable to attend, and who feel a sufficient interest in the subject, can compensate for their absence by communicating their views in writing, to be read at the meeting. This is very much to be desired, as it is well known that there are many men who can deliver their opinions and experience quite as well in writing as by word of mouth.

It should also be remembered by the members of the Car-Builders' Association, that at these monthly meetings, aside from their social features, there is a great deal of preparatory work done, unconsciously it may be, which tells very effectively at the annual meetings, and on this account it is important that the former should be well sustained.

The subject for the January meeting will be the existing Rules Governing the Repair and Interchange of Freight Cars.

The Chicago & Northwestern road is building at its Chicago shops two dining cars like the ones illustrated in the July CAR-BUILDER, except that at the kitchen end of the car there are two doors from the platform, one opening into the kitchen and the other into the passage way leading to the dining room. The road is also building a lot of ten cabooses. The locomotive shops are engaged upon ten of the standard style illustrated in the August CAR-BUILDER, making 18 built during the year. The road has purchased 40 engines from the Baldwin Works, and is receiving 12 from the Taunton Mfg. Co. The Grant Works, at Paterson, are building 30 to be delivered in February and March. With the exception of ten 4 wheel switching ponies, these engines are all 8-wheel, 38 tons, 5-ft. drivers and 17x54 cylinders.

### The Fontaine Locomotive.

We give herewith engravings of Fontaine passenger engine (No. 1), which has been running for several months on the Canada Southern road; and also of another engine of the same type (No. 3), designed for freight service, but which is not yet completed. It differs, as will be seen, from the passenger engine by having connected drivers. Another passenger engine (No. 2) has recently been built, and has made some trial trips on the New York Division of the Pennsylvania Railroad. It differs in no respect from No. 1 except that the cylinders are one inch larger in diameter.

In regard to the peculiar construction of this type of engine, and the advantages thereby secured as compared with engines of the ordinary kind, Mr. John Orton, the Mechanical Superintendent of the Canada Southern Railway, writes as follows to the *Scientific American*:

In compliance with your special request, I have much pleasure in furnishing the following data and remarks relative to the locomotive engine "Fontaine." A very general description of the leading particulars has been given previously, but as many of your readers may not have seen those particulars, it will not be out of place here to reproduce some of them:

Diameter of cylinders.....	16 in.
Stroke of pistons.....	24 "
Diameter of driving wheels.....	72 "
" friction ".....	56 "
" rolling ".....	70 "
Total wheel base.....	21 ft. 5 "
Total weight of engine in working order.....	84,000 lbs.
" on drivers.....	34,000 "
Outside diameter of tubes.....	2 in.
Diameter of barrel of boiler.....	48 in.
Dimensions of fire grate.....	62 in. x 38 1/2 "
Number of tubes.....	140
Length of tubes.....	11 ft.
Square feet of grate surface.....	143 1/2
" heating surface in fire-box.....	100
" " " tubes.....	806
Total heating surface.....	906 sq. ft.

For several months the engine has been running in general passenger service on the Canada Southern Railway, and during that time has done some good work. The boiler and machinery differ in construction very little from those of the ordinary kind, except that the driving wheels are elevated so that their axle is just above the top of the boiler, and the cylinders and motion work are at an inclination of 17 1/2 degrees to correspond. In a vertical line, and immediately between the drivers and the rails, are auxiliary wheels of a double tread construction, combining friction and rolling wheels in one. Both driving and friction wheels have plain cylindrically turned steel tires, but the rolling wheels have the ordinary flanged tires for running upon the rails. The spread or gauge of driving and friction wheels is alike, the inner faces of the tires being just wide enough apart to clear the outside of the rolling wheels.

The propelling power of the rolling wheels is entirely due to the frictional contact and revolving force communicated to the friction wheels by the drivers, and is proportionate to the weight and force with which the frictional surfaces are brought together and made to revolve. In order to insure the efficiency of the frictional contact and prevent the wheels slipping over each other, a small steam cylinder communicating with the boiler is fixed on each side framing, to which a system of levers and connections is so devised that by opening the communication between the boiler and small cylinders, the upper and lower wheels are brought together with a force considerable above the normal weight effected by mere gravitation of the drivers, so as to include the weight of the lower wheels in the adhesive power of the engine. This frictional device is used chiefly when starting a train, or when a heavy pull is necessary, and requires the greatest adhesion; but when running quietly, or hauling light trains, the normal weight of the driving wheels, as they bear on the lower ones, gives all the adhesion needed.

In its operation the "Fontaine" differs from an ordinary engine in the fact that in the latter the fulcrum of the applied force is at the tread of the wheels in their contact with the rails, and its power is given out at the crank pin when that is above the axle, and on the front cylinder head, and thence to the axle when the crank is below it; whereas, in the "Fontaine," the fulcrum of the applied force is constantly at the axle of the drivers, and the power given out is continuously

at the perimeter of the drivers, at the points in contact with the friction wheels, the effective power being the same as it would be were the drivers and friction wheels geared with spur teeth.

Paradoxically though it may appear, the "Fontaine" is, in reality, a stationary engine, so far as its machinery is concerned, but by the interposition of the auxiliary wheels, effecting a junction with the drivers and the rails, the engine becomes at once a locomotive or moving force.

An investigation of the power of such an engine necessarily requires a *modus operandi* different from that of an ordinary engine, inasmuch as the peculiar combination of the wheels is a departure from the usual practice, and introduces a principle for which there has been no precedent nor any regular formula established.

The power given out at the perimeter of the driving wheels revolving around their axle as a fixed center or fulcrum, as in the case of the "Fontaine," is precisely equal in effect as though the wheels ran upon rails, and the power was concentrated and given out at the crank pin, but with this distinction, that in addition to the usual power, there is a re-enforcement through the medium of the auxiliary wheels, which fact, unfortunately, appears to be somewhat misunderstood, and, therefore, it will be well here to try to make that point clear. Preparatory, however, to taking up the point as represented in the "Fontaine," the principle involved will be more readily understood from the following illustration. Let us assume that the driving and auxiliary wheels are exactly of equal diameters, and that the driving wheels are made to revolve. The effect of this would be in one revolution of the drivers the lower wheels also would make one revolution, and travel on the rails a distance equal to the circumference of the wheels; and if a train of cars had been attached to the axle of the lower wheels, the train would also be hauled an equal distance. Now, the propelling force applied by the drivers at the top of the lower wheels, in consequence of the leverage there being twice that of the resisting force at the axle, would pull double the weight that evidently could be done were the same force applied in a direct horizontal line with the axle of the lower wheels.

The superiority of the "Fontaine" is based on the soundness of this principle of re-enforcement of power by the interposition of the auxiliary wheels; the tractive power, however, of such engines will necessarily vary with the relative differences in the diameters of the wheels, and the consequent leverages of the propelling forces, as compared with the leverage of the resisting force acting at the axle of the lower wheels. Now if we take the wheels of the "Fontaine," as in operation, the driving wheels being 72 inches, the friction wheels 56 inches and the rolling wheels 70 inches in diameter, we have a combination which, under an equal speed of piston, will have the effect of increasing the progressive speed of the engine on the rails to that of an ordinary engine with driving wheels 90 inches, or 7 1/2 feet diameter. This increase of speed, however, necessarily reduces, in a measure, the tractive power, in an inverse ratio with the resultant equivalent for the larger sized wheels, except that, as the applied or propelling force operates at 63 inches from the rails, while the resisting or opposite force acts at 35 inches from the same point, there will be a re-enforcement or theoretical difference of power equal to nearly eighty per cent. in favor of the "Fontaine" arrangement. It should be borne in mind, however, that the whole of this large excess of gain has never been claimed in practice, for the reason that a large portion of it is absorbed in the additional friction involved by the use and action of the extra wheels and bearings; but there is undoubtedly an advantage gained over an ordinary seven and a half foot single driver engine, equivalent to at least thirty per cent., which can be utilized to that extent either in the hauling of heavy trains, or running at greater speed with similar trains; or the speed may be equal, and there will be thirty per cent. less expenditure of fuel.

The novelty in the construction of the "Fontaine" has called forth from some scientific experts very peculiar criticisms with regard to its capabilities, but in no case has there appeared anything like a reasonable exposition in which a fair comparison was made with an ordinary engine of equal resultant dimensions. In one mechanical paper a distorted diagram was published, and an argument based thereon to prove the fallacy of the "Fontaine," but either prejudice or the ignorance of the writer, with respect to the action of the locomotive, was evident from the fact that, in comparing the propelling forces of the wheels of the "Fontaine" and an ordinary



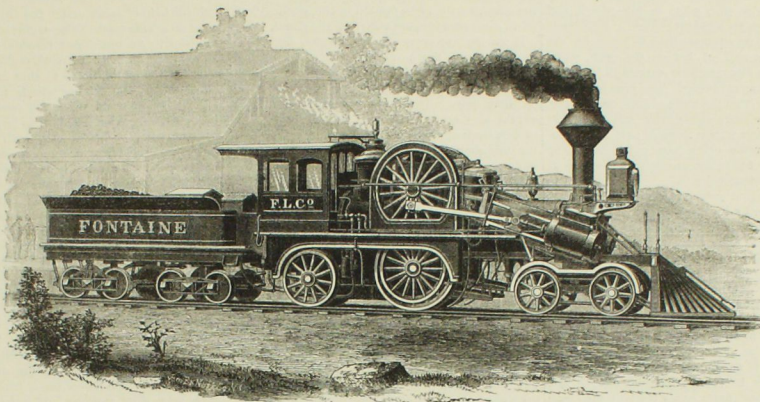
engine, he assumed in his calculations that the leverage forces had their fulcrums at the axle instead of at the rails. Thus the results deduced were as erroneous as the argument; for it is a well-known fact that all wheels in locomotives used for propelling purposes and running upon rails have

their fulcrums at the rails, while the distances to the centers of their axles, as measured from the rails, are, taken alternately with the backward and forward strokes of the pistons, either the long or short arms of the propelling leverages.

A careful investigation of these forces will prove the theory herein set forth, and will, without doubt, confirm the superiority of the "Fontaine" as a combination of speed and power over any other existing type of locomotive.

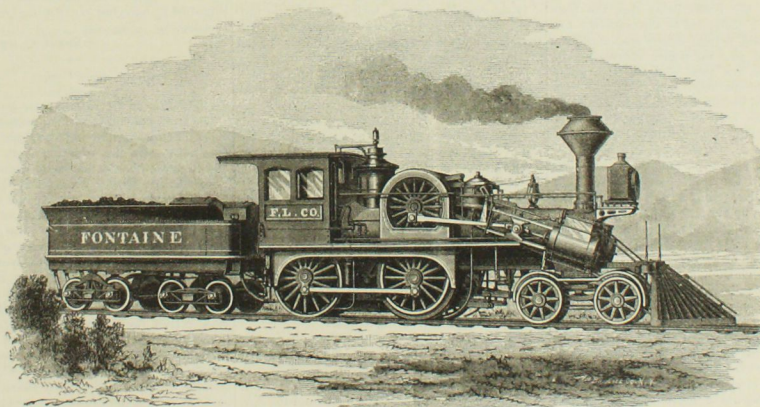
JOHN ORRISON.

Canada Southern Railway.



FONTAINE LOCOMOTIVE, NO. 1.—FOR PASSENGER SERVICE.

Has been running for several months on the Canada Southern Railway.



FONTAINE LOCOMOTIVE, NO. 3.—FOR FREIGHT SERVICE.

This engine is not yet completed. The dimensions are as follows:

Cylinders.....	17x24	in.	No. of tubes.....	100	Heating surface in tubes.....	921	"
Diam. of upper driving wheels.....	60	"	Length of tubes.....	11	Total heating surface.....	1,033½	"
" friction.....	70	"	Diam. " (outside).....	2	Height of center of boiler above rail.....	5 ft. 11	in.
" lower.....	78	"	Length of fire-box (inside).....	72	Weight on driving wheels.....	34,500	lbs.
" truck.....	40	"	Width " " ".....	35	Total weight of engine.....	82,000	"
Wheel base.....	23 ft. 4	"	Grate area.....	17½	Increase of friction between driving wheels		
Diam. of boiler (small course).....	48	"	Heating surface in fire-box.....	112½	through compound levers.....	32,000	"



### Communications.

#### Accidents to Locomotives on the Road—How to Deal with Them.

To the Editor of the National Car-BUILDER:

The locomotive engineer who is "posted" knows or ought to know just what to take down and what to do when an accident occurs. Nothing is more galling to an engineer than to bring his engine in with the half of her on the tank, when one-fifth of the disconnection carried in that way would have answered better. The idea held by so many engineers, that the more of their engine they take down the more safely she can come in alone, is of course wrong, as each part so disconnected leaves some other part either better or worse off. The following suggestions may be of value in such emergencies:

When an engine gets off the track the first thing to be done by the engineer, if he is not disabled, should be to pull his fire, if the position of the engine is such as to leave the crown-sheet or flues uncovered with water. If the ash-pan is jammed, or if from any other cause the fire can not be pulled or dumped, it may be smothered by shoveling green sand, sand, earth or snow into the fire-box. If the engine cannot be replaced without the help of another engine, the side and main rods should come down to prevent them from being sprung. If the engine is still on her wheels it will generally be found that she can be got back on the track more easily the way she came off. In case of a broken side-rod, disconnect the broken rod and the opposite side-rod also. This is all that is necessary. The necessity for taking down the opposite rod is that if only the broken rod is removed and the pin on that side is on either quarter, the pin on the opposite side being on the center can not start the back drivers through its side-rod, should the forward drivers slip in starting; the result being that the back drivers, not being compelled to slip with the forward ones, would remain nearly stationary, the front pin would pass the center, shortening the distance between the pins, and the rod would bend or the pin break, necessarily.

If the main rod breaks, disconnect it; block the cross-head at the back end, disconnect the valve stem and tie it to the hand rail if it has a joint, and then go ahead. It would be as well, in connection with the above, to pull the valve clear back so as to open the front port or cover both ports with the valve, jamming the gland on the stem by screwing up one side only.

The plan frequently adopted by engineers after taking down the main rod is to place the piston at the back end of the cylinder, open the front port and jam the gland on to the stem to hold it in position. This plan is a poor one, as the valve may shift, and then a bad cylinder head is the result. Always block a piston or cross-head at the back end of the guides, for if the blocking should get loose, the front head, which is the cheaper, would alone suffer. A better plan than carrying blocking for the cross-head is to have the blacksmith make a hook out of 1½-in. round iron, also a flat piece or bar 15 inches long, 1½ or 2 inches thick and 4 inches wide, with a hole through its center for the shank of the hook to pass through—the shank being threaded for a nut. When it is necessary to block a piston get it to the back end of the guides, pass the hook round the cross-head wrist and the shank through a hole in the other piece which rests against the face of the yoke supporting the back end of the guides, run up a nut on the shank of the hook back against the bar, and the piston is secured. Two nuts are better than one, the outside one being jammed on to the other.

If a leading wrist-pin breaks, the main and side-

rods on that side and the side-rod on the other side must come down, the piston must be blocked and the valve stem disconnected. In case of the breaking of a back pin both side-rods must come down. If a valve stem breaks, take it down, also the main rod on that side, in the meantime blocking the piston. If the stem is broken outside of the chest, let the piece remain in the stuffing-box, fill in some packing and screw up the gland.

If the back-up eccentric rod breaks, take both eccentric rods down on that side of the engine. If it is a go-ahead rod, it alone may come down with the straps, also the main rod and valve stem on that side. The main rod and valve stem should also be disconnected in the case of a broken back-up eccentric rod, and in either case the link should be disconnected from the tumbling-shaft by disconnecting the hanger. If the lifter tumbling-shaft, arms, saddle-pin or reach-rod breaks, a piece of wood may be fitted and tied in between the block and top of the link slot for the link to rest on. The piece should be long enough to raise the link to cut-off where the engine is desired to run. In case of a broken reach-rod or tumbling-shaft, both links must be blocked up as described. As the engine will then have to be held entirely with the brake, great care will be necessary. For broken eccentric straps or eccentrics, proceed as in case of eccentric rods. For a slipped eccentric—assuming it to be the go-ahead one and the engine a link engine—put the engine on the center on the side of the slipped eccentric, pull the reverse lever into the full back-up notch, mark the valve stem flush with the gland with a knife blade, throw the lever in the full go-ahead notch, turn the slipped eccentric till the mark on the stem reappears in the same position as when marked, notice that the slipped eccentric is not in the same position as the back-up eccentric, but the full part or belly nearly opposite, and then go ahead.

In the case of a broken spring hanger, the broken spring should be removed, unless an extra hanger or a chain is carried, in which case the end of the spring may be held by the new hanger or the chain; if being necessary to jack up the back part of the engine, under the footboard, to take the weight off and allow the insertion of the hanger or chain. If neither hanger nor chain can be had, slip a block of wood or rubber under the end of the equalizer thick enough to raise it about level, the weight being removed from it by jacks under the foot-board. If the engine has far to go or has a train to pull, it will be best to put a block of wood over the driving box, between it and the frame, and over the wheel where the hanger is broken, to ease the other spring. If jacks are not carried the driver may be run on to a stick of wood 4 or 6 inches in thickness, place under the forward wheel to take the weight from the back wheel, and vice versa. A broken spring should be treated the same as a broken spring hanger.

A broken equalizer should be removed, as it may get into the wheels, also the springs and wooden pieces placed over the driving boxes to keep the frame up. A broken tire, if clear off, requires the wheel center to be kept from the rail, either by running the wheel on to a block of wood, or by jacking up under the wrist-pin and fitting a piece of wood between the oil cellar and pedestal brace. The two side-rods should come down if the tire is a back or forward one, and also the main rod on that side. If the engine has far to go and a train to pull, it is better to remove the oil cellar and fit a notched piece of wood in its place to give a proper bearing for the shaft, as otherwise the shaft will rest on the thin edges of the oil box—a bearing entirely insufficient, if any distance is to be run or a load pulled. The writer has seen engines brought in with broken tires and the shaft running on the oil cellars, the bearings being so

badly cut as to make it necessary to remove the wheels, re-turn the bearings and fit new driving box gibs or brasses.

It should be remembered that whenever the main rod is disconnected, the piston must be blocked and the valve stem disconnected. A broken front truck wheel or axle can usually be chained up with the help of jacks under the front end, so as to get on a side track. The engine should be run very slow. An unshipped throttle requires that the steam pressure be reduced, pulling the valve stem into the middle notch to shut off, and when taking water, the driving wheels to be blocked with sticks of wood when the tender is in the right position. A bursted flue can be plugged with a wooden plug, or better still, with an iron one held in a pair of tongs or some special device for that purpose. If a driving axle breaks so as to leave the wheels in position, the engine may generally be run alone on to a side track, and extra wheels and axles sent for. A broken cylinder head requires that the main rod on that side should come down, and the ports covered by the valve and the valve stem disconnected. If the steam chest or branch pipe in front end breaks, a piece of 2-inch plank with a rubber gasket beneath it should be bolted to the "nigger head" or "T-head", the branch pipe being removed. The main rod should be disconnected on that side. If the steam pipe breaks inside the boiler, the same means may be employed as for an unshipped throttle. A broken flange on a truck wheel requires very slow running. If a tender axle or wheel breaks, that end of the truck may be chained to a tie placed across the apron of the tender, blocking being placed between the tie and body of the tank to ease the strain on the apron. Both ends of the tie should be chained to the truck.

The above will cover the ordinary mishaps to which locomotives are liable, and which can be remedied by carrying out the suggestions recommended.

FRANK C. SMITH, M. E.

#### Snow-Cars.

To the Editor of the National Car-BUILDER:

The matter of constructing machinery and appliances for clearing snow and ice from railway tracks does not receive the attention from car-builders and master mechanics that its importance demands. Not that the matter is overlooked, but it is apt to be "crowded out," as the newspaper men say, by the pressure of other duties. Most of the roads in snowy regions have plans of their own for rigging snow-ploughs and cars. Some of these are very efficient, and more of them would be so but for the reluctance of many road officials to adopt the devices of other and neighboring roads. It is now the season for putting these devices in trim for active service. As a rule, roads in snowy localities are provided with this kind of equipment, but in the case of other roads that are less liable to snow and ice obstruction, there is frequently little or no provision for such emergencies. In view of the enormous expense of clearing snow and ice from tracks, the obstruction of traffic, and danger to life and limb, it may not be out of place to offer some suggestions as to what may be done, as well as to what has been done to avoid such expense, delay and danger.

It is hardly necessary to refer to the fact that most of the roads north of the forty-first parallel of latitude have regular snow-ploughs. It is not of these that I would speak, but rather in regard to the minor details of this kind of apparatus. What is generally known as the "snow-car" has been the most effective in removing snow of ordinary depth. These cars have been constructed in various ways; but the following is



try to remove the old fit new driving

whenever the main must be blocked. A broken front fly be chained up at front end, so as one should be run while requires that pulling the valve shut off, and when axle to be blocked. A tender is in the an be plugged with an iron one special device for breaks so as to engine may generate track, and extra broken cylinder rod on that side is covered by the connected. If the not seal breaks, a ber gasket beneath nigger head" or ng removed. The d on that side. If a boiler, the same for an unshipped a truck wheel re- a tender axle or e truck may be the apron of the l between the tie the strain on the old be chained to

dirinary mishaps to and which can be suggestions recom-

C. SMITH, M. E.

er-Building: whinary and appli- rum railway tracks from car-builders (importance demands ed, but it is apt to paper men say, by lot of the roads in ir own for rigging ne of those are hem would be so any road officials r neighboring r putting these de- t. As a rule, roads d with this kind of ther roads that are ution, there is fre- for such emergen- expence of clearing be obstruction of limb, it may not be pations as to what it has been done to langer.

refer to the fact of the forty-first r snow-ploughs. It peak, but rather in this kind of appa- own as the "snow- in removing snow rs have been con- it the following is

probably as good a method as any in use: An ordinary freight car is fitted with wings which are strongly hinged so as to hang vertically and swing in and out like a barn door. When shut, they lie back against the side of the car body, and when open stand at an angle of 45 degrees with the rail. The wings extend downward very nearly to the rails, and look as if the car doors had slipped down. They are opened and closed by toggle-jointed levers operated by a brake wheel inside the car, and clear the snow for a distance of four feet outside the rails. In ordinary depths of snow they work well, but are of no use in heavy drifts.

The clearing of flange ways is of great importance, and is very successfully accomplished by a simple and durable device used by Mr. Klohs, the Master Mechanic of the Ogdensburg & Lake Champlain road. It is attached to the under side of the car having wings, as above stated, but cannot be clearly explained without drawings. These snow-cars are profitable stock for any road that is at all troubled with snow. They may be run during the winter as caboosees, and in this way do double duty. A well-arranged snow-car can be so constructed as to combine a first-class caboose with a snow-plough, and be run on regular trains, or as often as occasion may require. To do a great deal of track-cleaning, all that is necessary is to place the car in charge of a man who is thoroughly acquainted with the bridges, station platforms, and with whatever is likely to interfere with the car wings. In this way not only can great expense be saved in snow shoveling, but many of the accidents incident to snow blockades will be avoided. Much fuel will also be saved by keeping the flange ways clean. It is expensive running trains with the wheel flanges "on ice," and I would say in conclusion, that this whole subject is a good one for car-builders to think about.

WM. S. HUNTINGTON.

#### Head-Linings, and Inside Decoration of Passenger Cars.

[A Paper read at the Twelfth Annual Convention of the Master Car-Painters' Association, held in New York, Sept. 21, 1881, by Mr. D. D. Robertson, of the Michigan Central Railroad.]

Gentlemen of the Convention: In introducing the subject of the inside decoration of cars, I do not consider myself as better qualified to deal with it than others of my associates. It is a subject full of interest, and I submit my views upon it because it has been specially assigned to me.

There has been a growing tendency in some quarters toward lavish embellishment in the outside finish of passenger cars, and the very character of the present popular style of decoration, unless judiciously and carefully handled, is apt to run into what is altogether out of place, if not essentially vulgar. However beautiful and desirable ornamentation may be in itself, as applied to railway cars, if it is not of such a nature as to harmonize with the uses of the structure to which it is applied the effect becomes ludicrous if not offensive. Rare and costly jewels, if used with taste and discrimination in personal adornment, enhance the beauty of the wearer; but if they are misapplied, the beauty of both jewels and wearer is sure to be tarnished. How often do we see ornament, intrinsically beautiful in itself, lose all its power by being placed in juxtaposition with what is inharmonious, crude and conflicting. While I admire a proper and sparing use of ornament on the outside of cars, I am decidedly averse to that excessive elaboration which runs into extravagance and vulgarity, and which evinces not only a lack of taste and judgment, but involves an expense in the first painting and in subsequent maintenance that is little better than wasted. The same outlay expended

upon inside decoration, which would be less liable to be injured and more likely to be appreciated, would be a more economical use of means, and lead to more gratifying results by elevating the popular taste to a higher standard.

Surely, if any part of a passenger car is deserving of ornament it is the inside, where the great mass of traveling people are seated for hours together, with little else to do but to inspect the designs and peculiarities of the decorative finish. The very character of the subjects and forms they are then forced to gaze upon must leave an impression on their minds corresponding to its beauty or ugliness, or its lack of both. We are all aware of the great progress that has been made in the inside treatment and finish of cars. There was a time when head-linings were unknown, and great was the revolution when the practice of sealing the car roof was superseded by the introduction of printed cloth stamped with the stereotyped tablecloth pattern. This improvement was considered the climax of perfection, and having once dropped into this rut it was hard to get out of it. For years no one thought of any further improvement, until at last the regularly prepared canvas linings, with original designs and beautiful hand-work, took the place of the printed tablecloth turned up side down. This again was a wonderful improvement, and has done more to render our cars attractive than any other one thing in the decorative way. It has also afforded an opportunity to the painter to display to better advantage his artistic taste and capacities. When these canvas linings were first introduced, there was a tendency to overcrowd them with work, and to make heavy and raised designs, which, being too near the eye, were unsuitable; but after the arabesque and Eastlake styles came into vogue, it was found that their flat character was much more effective.

The fundamental principles which underlie all artistic decoration are getting to be better understood every year. There are certain immutable laws which govern every line and curve, every form and color, and give to them a grace and harmony that appeal to the eye as music does to the ear; the lack of harmony and fitness in the one case being as readily detected as discord in the other; and as the arrangement of notes and time in music gives rise to different emotions, so does the arrangement of lines and curves and the forms of embellishment in painting produce a variety of pleasing impressions. By a knowledge of these principles, which can be attained by study, the combinations of form and color can be so arranged as to affect the mind and sensibilities through the medium of the eye, very much as music does by means of the ear.

But there has been still another and more recent improvement in head-linings. I refer to the use of veneer instead of cloth. The veneer ceilings are considered as much superior to cloth as cloth was to the roof-ceiling. They are remarkably cheap, and so solid and substantial that but little decoration is necessary to produce a pleasing effect. The agreeable contrast between the natural grain of the wood and the deeper shade of the bands and moldings is all that is necessary to harmonize with the other parts of the interiors of certain classes of cars—smoking and dining cars, for example. But in the case of parlor and dining-room cars, the decorations of these ceilings should be in keeping with the style of the cars, by giving such a character to the lines, curves and colors, as will be suggestive of cheerfulness and life. While these head linings are deserving of the highest commendation as an important improvement upon previous ones, they are still open to some objections. One barrier to their general adoption is their increased cost. It is true that superior quality implies higher

prices, but when the prices exceed so much those of cloth linings, it is difficult to induce road managers to increase expenses by introducing the new linings, when the great object is to reduce expenses. Another objection to wood linings is their liability to injury from heat and moisture, a liability which results from the way in which they are put together. A heated roof or a leak swells the veneering, and in many cases takes it off in strips. To obviate these objections, I have, during the past eighteen months, been experimenting with some materials that would be less affected by these causes, and at the same time make a handsome ceiling. About a year ago I fitted up one car in this way, and it has proved a success. The material used is heavy tar-board pressed into the form of the roof and strengthened by burlaps. It is then grained and decorated in the usual manner, and when finished has the same appearance as the veneers, will wear as well, and can be finished at much less cost.

With respect to the other interior decorations little need be said. In the great majority of cars there is but little space, aside from the ceiling, for the display of ornamental work. The windows have been increased in size, and are now so large that the panels are comparatively narrow, and when these are carefully finished in oil or varnish, little more is required. But when ornamentation on the frieze or side panels is needed, it should be very simple, in gold in dark woods, and in harmony with the linings. If the panels are in light woods, the decorative work may be in color and gold combined, the color edged with a darker shade, and the gold with black.

#### An Expanding Mandrel.

An expanding mandrel recently introduced consists of two parts, viz.: a ribbed split sleeve and the mandrel proper. The sleeve, which is made of steel, is pierced with a tapering hole, and one end of the mandrel is turned to exactly fit this hole. The sleeve is then turned to the required diameter, preferably on the mandrel to which it belongs, after which the material is removed in such a way as to leave three narrow longitudinal bearings with equal depressed spaces between them. These depressions extend very nearly to the bore of the sleeve, leaving only sufficient metal to hold the bearings in position. The sleeve is cut apart through one of these depressions, leaving it free to contract or expand. In using this mandrel, the sleeve is placed in the hole, where, by lightly driving the mandrel into it, expansion will occur, and the three bearing surfaces will be forced into sufficient contact. The contrivance is simple in construction, can be readily and inexpensively made as required for use in a machine shop, and can also be advantageously manufactured and sold as a standard tool.

MR. F. C. ROBERTS, conductor of the dining car "Continental," which runs on the Chicago & Alton between Mason City and Pontiac, Ill., and supplies breakfast to one train, dinners to two, and supper to a fourth each day, reports the meals furnished during nine months, from Feb. 1, to Nov. 1, 1881, as follows:

Meals to passengers.....	30,283
Meals to train men.....	1,419
Luncheon.....	1,875
Total.....	33,579

Mr. Roberts has devised a seat for dining cars, which is hinged so as to drop down under the seat-back while passengers are passing in and out beside the table. It can be raised or lowered by the waiter. One of them is to be tried in the "Continental," and if it works satisfactorily they will be put in the new dining car now building at the Bloomington shop.



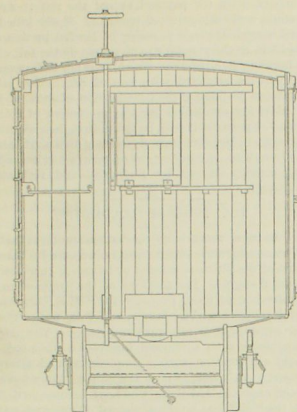




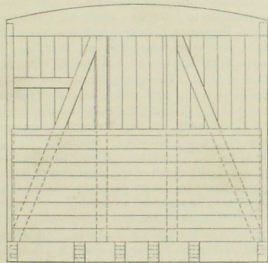
## Flanging Boiler Heads.

The Locomotive says: The study of the causes, and nature of the defect known as grooving, as well as the character and appearance of the fractures which frequently occur in the flanges of heads or tube sheets and other parts of boilers where flanging is done, leads to the conclusion that flanges, as ordinarily turned, are very much too sharp, or turned to too short a radius. The evil effect upon iron of bending it too sharply may be shown by a diagram which represents a full size section of a tube sheet at the angle or flange, bent to a radius equal to about the thickness of the plate, as frequently found in practice. Indeed the sheets are frequently found with a still shorter bend, sometimes almost a sharp corner on the inside. The effect of this is to unduly strain the iron, both on the outside and inside of the flange, the outside being under a combined tensile and bending strain, generally to such an extent that a section of the flange shows a laminated appearance, caused by the layers of the plate being separated and sliding upon each other; while the outside of the plate, unless of extra fine iron, worked with more skill than is usual, if examined closely, will be found to be filled with small cracks having the appearance of season checks, as seen in timber. The inside of the flange, on the contrary, is in a state of undue compression, the fibers being crushed and buckled up. The effect of too sharp flanging may easily be shown; by taking a narrow strip of boiler plate and bending it sharply, the effect will be very marked. This disturbance of the fibers and laminae of the iron renders it peculiarly susceptible to the corrosive actions of the acid present to a greater or less extent in all waters, the result being manifested by grooving or channeling and fracture along the angle of the flange, caused by the combined action of grooving and the "working" caused by variations of pressure and contraction and expansion.

The chief reason, says an exchange, why the American Humane Association has been unable to select from the 700 designs for cattle cars one that is worthy of receiving the \$5,000 prize, probably is that such a reward, with the possibility of having to share it with two or three other inventors, was not large enough to secure the attention of inventors of the first class. If any proper design had been offered it would have to become the "unembarrassed property of the association" before it could receive the prize, and the successful competitor would have had to take out a patent in the United States and Canada at considerable expense after having spent time and money on the construction of his car, to which should be added the possibility that after all he might not win the \$5,000. American inventors fly at higher game than this.



End Elevation.



Inside View.

The Chicago & West Indiana Bolt Railway Co. are laying track, and at no distant day Chicago will be encircled, or rather semi-circled, by a road connecting with all the roads entering the city. This will greatly facilitate traffic, both in the city and on the lines diverging therefrom.

		Rough sizes.		Dressed sizes.
2 End door caps.....	oak	3½ x 4 in. x 4 ft. 9 in.	3 x 3½ in. x 4 ft. 6 in.	
2 Side ".....	"	3½ x 5½ " x 11 " 6 "	3 x 5 " x 10 " 9 "	
1 Brake seat.....	"	2½ x 7½ " x 3 " 0 "	1½ x 7 " x 2 " 10 "	
1 ".....	"	2 x 7½ " x 1 " 8 "	1½ x 7 " x 1 " 1½ "	
2 Side door stops.....	"	2½ x 2½ " x 7 " 0 "	2 x 2 " x 6 " 10 "	
2 ".....	"	2½ x 4½ " x 1 " 1 "	2 x 4 " x 1 " 0 "	
2 End ".....	"	2½ x 2½ " x 3 " 6 "	1½ x 2 " x 3 " 3 "	
2 " " sills.....	"	1½ x 4½ " x 2 " 0 "	1 x 4½ " x 1 " 11½ "	
2 End door furring pieces.....	"	1½ x 2½ " x 3 " 6 "	1½ x 1½ " x 3 " 2 "	
2 " ".....	"	1½ x 1½ " x 3 " 6 "	1½ x 1½ " x 3 " 2 "	
4 " " stiles.....	"	2½ x 4½ " x 3 " 6 "	1½ x 4 " x 3 " 3 "	
4 " " rails.....	"	2½ x 5 " x 2 " 0 "	1½ x 4½ " x 1 " 10 "	
4 Side door stiles.....	pine	1½ x 4½ " x 2 " 0 "	½ x 4 " x 1 " 6 " 10 "	
6 " " rails.....	"	1 x 6 " x 7 " 0 "	¾ x 5½ " x 6 " 9½ "	
		1 x 8 " x 5 " 4 "	¾ x 7 " x 5 " 3 "	

## TRUCK TIMBERS.

4 Center pieces.....	4½ x 13 in. x 7 ft. 6 in.	4½ x 12½ in. x 7 ft. 2 in.
2 Swing beams.....	9½ x 10½ " x 6 " 0 "	9 x 10 " x 5 " 7 "
2 Swing planks.....	3 x 11 " x 6 " 0 "	2½ x 10½ " x 5 " 7 "
2 Brake bars.....	4½ x 7 " x 6 " 0 "	4 x 6 " x 6 " 6 "



PUBLISHED MONTHLY

R. M. VAN ARSDALE,  
5 DEY STREET.....NEW YORK.

JAMES GILLET, Editor.  
L. E. WATERMAN, Corresponding Editor.

DECEMBER, 1881.

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## EDITORIAL ANNOUNCEMENTS.

Addresses.—Business letters should be addressed, and drafts and money orders made payable, to THE NATIONAL CAR-BUILDER. Communications for the attention of the Editor should be addressed EDITOR NATIONAL CAR-BUILDER.

Advertisements.—Nothing will be inserted in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. The editorial department will contain our own views and opinions; and the rest of the reading matter, aside from advertisements, will be such as we consider of interest to our readers.

Contributions.—Articles relating to railway rolling stock construction and management, and kindred topics, by those who are practically acquainted with these subjects, are especially desired. Also early notice of changes in railroad officers, organizations and names of companies.

Special Notice.—As the CAR-BUILDER is printed and ready for mailing on the last day of the month, advertisements, correspondence, etc., intended for insertion, must be received not later than the 25th day of the month.

SUBSCRIPTIONS to the CAR-BUILDER will be received, and copies kept for sale, at the following places:

A. WILLIAMS & Co., 283 Washington Street, Boston, Mass.

L. SCHAEFFER, Cigar and News Dealer, Grand Pacific Hotel, Chicago, Ill.

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## THE CAR-BUILDERS' ASSOCIATION AND PATENTED INVENTIONS.

In the discussions at the yearly meetings of the Car-Builders' Association, and in the reports of committees made at such meetings, there has always been a marked disinclination to indorse patented appliances, or to recommend any thing of the kind for general adoption by railway companies in their respective car departments. The reasons for this are well understood, and have heretofore been deemed sufficient to justify the course pursued; but the time is evidently at hand when the merits of patented inventions pertaining to car construction and equipment will have to be discussed upon these occasions with less restraint and embarrassment. The mutual relations which exist between inventors and the railway interests represented in the association, render



t next to impossible for committees to report upon, or for members to discuss, the merits of any particular appliance without recognizing the inventor or owner of the patent and his rights as a patentee. In the early experience of the association it was not so very difficult, theoretically at least, to "steer clear of patents" in what was said and done at the annual meetings, but the practical difficulties that lie in the way have increased year by year until they have become too formidable to be evaded.

This state of things was very forcibly exhibited in the discussion at the last annual meeting of the association, on the report of the committee on standard brake shoes. The committee reported that it was unable to recommend any one of the many kinds of shoes in use, without coming in contact with patents, and a further expression of opinion by the convention was therefore invited as to the best kind of shoe to be adopted. The members then proceeded to express their opinions, and in doing so, found themselves confronted with the same difficulty that the committee had been contending with, namely, contact with patents. Pending the discussion, a resolution was offered approving of a certain patented brake shoe, and the subject matter of the resolution was finally referred to a committee to be reported upon at the next meeting. The drift of what was said indicated that the members were much less sensitive on the subject than on sundry previous occasions. There was no such tempest of feeling exhibited as at the Chicago meeting in 1879, when it was proposed to recommend a particular kind of drawing attachment, and those who were inclined to vote for the proposition became frightened at their own temerity at the bare suggestion that such a recommendation would compel every road to use the device or be liable for damages in case personal injuries could be shown to have resulted from not using it. At the very outset of the discussion on the brake shoe report, the patent question obtruded itself and would not be put aside. There was no disposition manifested to ignore patents and patentees and the names of patented appliances for fear of advertising somebody's wares, nor was it proposed to evade the point by merely recommending in a blind sort of a way the mechanical principles involved in such devices. There was, on the contrary, an apparent willingness to look the situation squarely in the face, and to deal with patents and their owners in a practical business-like manner, by approving and even recommending for general adoption whatever should be deemed worthy, irrespective of the private interests of inventors.

Mr. Marden, the chairman of the committee, remarked in the course of the discussion, that the committee was under the impression that it could only investigate and report upon such brake shoes as were not patented, and that had it not been for this impression a different report would have been made, accompanied with specific data and tests. There is nothing in the constitution of the association to warrant this restricted view of the matter; the only clause it contains in relation to patents providing simply that patentees or their agents shall not be allowed to advocate their claims in the meetings. There is no restriction whatever upon the free discussion of patented devices, or as to the expediency of recommending such inventions according to their merits; and the impression to the contrary has had no other effect than to hamper investigation and make the committee reports more meager and unsatisfactory than they otherwise would have been.

A new or improved device in car construction is none the less valuable because it is patented, and the inventor would be lacking in business sagacity if he failed to take out a patent for his protection. There is no good reason why railway companies should not pay for the use of such

devices the same as other people who make use of patented inventions. They expect to do it, and whenever the invention is worth the cost, and sometimes when it is not worth any thing near the cost, they do do it. It is a fair business transaction of give and take, buy and sell, in which there is no compulsion, not even in respect to any particular device which a majority of the members of the Car-Builders' Association present at a regular meeting may have concurred in recommending—the question whether such device is the best of its kind, even for the time being, remaining an open one. It must be remembered also that patents are not granted in perpetuity, and that the most valuable ones must run out sooner or later and the subjects of them become free to all and open to competition. The roads are being relieved of a vast amount of trouble and perplexity by referring all patents and patent claims to the associations organized for the purpose of testing their validity. They are in this way protected from imposition and placed in a position to respect the just rights of patentees, avoid litigation for infringement by knowing in advance what property rights exist under the patent laws in regard to any device proposed to be introduced, and by purchasing full rights thereunder. There is no longer any inducement for roads to spend money in fighting patents rather than in paying for them.

The indorsement of particular inventions by the association is thought by some to be fraught with danger, in view of the general depravity of human nature, and the possibility that some of its members might be influenced by mercenary considerations, and in exceptional cases yield to the allurements of bribes by selling their votes for money. If there really is any such danger, the better way would seem to be to give it an opportunity to develop itself instead of suppressing it. If the corruption exists to any extent, it is none the less baneful for being shut in by the questionable policy of steering clear of patents.

#### ACCIDENTS TO RAILROAD EMPLOYEES.

The *Railroad Gazette* of Nov. 18 contains an estimate of the number of railroad employes killed and otherwise injured on all the railroads of the United States during 1879 and 1880. Definite returns, made under state authority, are given from ten States for '79, and from five States for '80, and from this data a calculation is made on the basis of population, and also the whole number of locomotives on all the roads, the result being, approximately, that from 1,200 to 1,500 employes are killed annually, and between 5,000 and 10,000 injured. The correctness of this estimate, although largely based on inference, will not be seriously questioned by any one who has given any thought to the subject. It is no secret that accidents of this class are very numerous, and that it is no easy thing to devise any very effective means for their prevention. Suppose every railroad company in the country was required, under legal penalty, to report every accident of this kind; that the total number thus definitely ascertained should equal or exceed the maximum figures given; and that the fact should be widely published every year. Would such a horrible and sickening record be sufficiently startling to lead to the adoption of such means of prevention as would materially diminish the number of casualties? We doubt it. The mass of the community are getting educated to these things, and look upon them as a matter of course. Like the casualties of war, they are inseparable from the service, and no safeguards that are only a little better than those already provided, and at the same time practicable, and not a drawback upon traffic, are likely to lessen the hazards to any

considerable extent. Railroad employes, like soldiers, work for pay and accept the risks. An annual well-authenticated record of 15,000 killed and wounded, would probably be heeded by them as little as the general run of people do the fall of a building in a populous street, or other unforeseen occurrence attended with loss of life. After all that can be done in the construction of cars, and in devising appliances for the protection of this class of persons, it will be found that their safety depends in large measure upon their own alertness and prudence in keeping out of harm's way instead of braving danger by foolhardy and reckless exposure.

#### THE FONTAINE LOCOMOTIVE.

Just now there is no mechanical problem that is attracting more attention in railway circles than that of the ultimate success or failure of this new type of engine. The opinions of the engineering profession, or more properly the "M. E." branch of it, appear to be adverse, and this, under the circumstances, is not very surprising. The new machine is such a marked innovation upon ordinary construction, such a nondescript and interloper, so to speak, that it might reasonably have been expected that those who have become settled in the belief that no improvement of any material consequence can be made upon the existing standard type, should look upon the new comer with about "as favorable eyes as Gabriel on the devil in Paradise." The two-story friction-wheel arrangement justly invites scrutiny and thorough investigation to determine what is gained or lost by it. Dogmatic opinions and assertions, theoretical demonstrations, and all that, are well enough as far as they go, but they do not and can not alter facts. The work which the engine is capable of doing and which it actually does do, measured by speed, weight of train, fuel consumed, economy of maintenance, conditions of track, etc., must ultimately determine the question at issue. The machine may turn out to be a failure; and if much of the testimony of scientific experts, based on theory and "fundamental principles," is to be regarded as conclusive, it has been a failure from the start, and its extraordinary performances on the Canada Southern road, as represented by General Manager Taylor, Mr. Orton and others, are quite unaccountable, except on the supposition that these gentlemen have been deluded by fallacious appearances. They testify in the most positive manner to its superior speed, power and economy in fuel, and we have as yet seen nothing to impeach this testimony except the assertion, unsubstantiated by proof, that the Baldwin engine with which the comparison was made in running on the above-named road, was in bad order, and was run in an extravagantly expensive manner for the purpose of showing a result more favorable to the Fontaine than would otherwise have appeared. If this is so, and if Mr. Fontaine was ignorant of what was being done, he was obviously fooled himself. Otherwise, he would hardly have felt warranted in going to the expense of building another engine just like the first one, except a slight increase in the diameter of the cylinders, and even another one still to be used in freight service.

In this matter we only insist on having fair play all round. The engine should have a chance to exhibit its capacities without too much prejudice in advance, and the inventor should deal fairly with himself and the public in all working tests that are made. We have no good reason for believing he has not done so. Even should his bantling turn out poorly in the end, he can point with pride to its "mile a minute" with a seven-car train, when not a few very knowing people predicted while the engine was on the stocks, that it would never run on a railway track at



all. In mechanics, fundamental principles, so called, are not always reliable, and although figures strictly speaking won't lie, they are sometimes misleading. Time was when the points of contact of four smooth faced driving-wheels resting upon rails equally smooth, with the weight now concentrated upon them, would not have been considered a sufficient fulcrum for starting a 300-ton train on a level track, much less to carry it up ordinary grades. And had it been proposed fifty years ago to run a rigid truck with two parallel axles with rigid wheels round a 10-degree curve at a speed of 25 miles an hour, plenty of fundamental principles would have been forthcoming from the book shelves to prove the impossibility of getting safely round a curve under such conditions. Yet the thing is done every day—in fact, several times a day—and nobody tries to figure out that it can't be done.

#### A GLANCE AT THE SITUATION.

The present year will long be remembered as a period of remarkable business activity, even if it should be followed by another in all respects like it. The great feature of this activity is the construction and equipment of railroads to an extent that has hitherto had no parallel in any single year. The "boom," as it is termed, shows no signs of abatement, but increases in intensity every day. The numerous car and locomotive shops that five years ago were nearly idle, are entirely unable to meet the demand now made upon them; and this is aside from the great number of cars and engines that are being constructed in the regular road shops. The same may be said of tools and machinery used in the construction of railroad equipment. The manufacturers are overrun with orders greatly exceeding their capacity to fill; and so it is with respect to steel rails, and many things included in the category of general supplies.

It is impossible not to contrast this state of things with the long period of stagnation which followed the collapse of '73. Is the present industrial prosperity of the country a bubble that is sure to burst when the limit of tension is reached? Notes of warning are beginning to be heard on every side. It is said that the thing that is to be is the thing that has been, that history repeats itself, that the good times in which we are all reveling, from the great capitalist to the day laborer, are too good to last, and that financial storms are as certain as atmospheric ones. Admit all this, and what of it? A prophet of evil gets no credit though he prophesy ever so truly. His predictions are about on a par with those of the weather prophets—forgotten as soon as made in the rush and scramble for making hay while the sun shines. It may not be possible for any one, even the wisest, to solve the problem in advance; but men of financial experience, whose views crop out now and then, are quite unanimous in regarding the new and projected railroad construction as the key to the situation. If the capital in these enterprises is judiciously invested to meet pressing needs, and not for the profits derived from their construction, there will be no crash, because each road will have a basis to stand upon in the shape of a paying traffic. But if a very considerable portion of the construction now in progress is merely speculative, consisting of lines starting from nowhere and terminating at any point where the funds give out, there will be trouble, because the capital will be sunk and business stability shaken by distrust. Nothing is more certain than that railroads are to be built over all the waste places of the continent, but it will not pay to build them too long in advance of population and production. Capital is proverbially timid, and it is also daring to the verge of recklessness, according to the way the tide sets. Six years ago nothing could tempt the vast idle accumulations

from their hiding places. There was no boom then, but there is the biggest kind of one now.

Another feature of the present business activity is a general rise in the prices of cars, locomotives, machinery, and other things required for the outfit of railroads. Ordinarily, a general advance in prices would be attributed to currency inflation—a depreciated dollar, either paper or metallic, it matters not which. But our national finances are understood to be on a far better basis than in '73, and there does not appear to be any apprehension that the basis is not really what it purports to be, a specie basis and not a delusive sham. The advance in prices, then, so far as rolling stock and other railway material is concerned, must be due to an excessive demand caused by the need of equipment for some 8,000 miles of new road within the next few months, in addition to the increasing wants of the old lines. When the stock of any commodity is short, and consumers needy and clamorous and disposed to bid against one another, the vender or seller naturally takes advantage of the situation to put up prices, and in a business of such immense volume as that of our car and locomotive industries it is not surprising that the movement should affect prices generally.

Nevertheless, in the matter of new mileage extension it is well enough to slow up a little and put on the brakes. Indeed, it will have to be done, in view of the fact that locomotive builders have orders in hand already to the full extent of their capacity to fill in all the coming year. Without locomotives to pull them there is no need for cars, and without cars no traffic can be moved. And, furthermore, Mr. Vanderbilt is reported as saying that there is not freight enough this year to go round, and the protracted war of the trunk lines gives color to the suspicion that a scarcity is or may be possible. That the thousands of miles of new road built this year will ultimately be a good thing for the country, just as the bankrupt enterprises started ten years ago have many of them turned out to be, there can be but little doubt, but the benefit thus derived should not involve the ruin of honest investors, and a periodical disturbance of the business relations of the country. Better slow up a little and let the journals cool.

#### ESTIMATE OF LOCOMOTIVE ROLLING STOCK.

A correspondent wishes to know how many locomotive engines there are in service on the railroads of the United States and Canada, and requests that a reply to the inquiry be made in our present issue.

The number of locomotives actually employed on the roads named at the present time can only be stated approximately, as there is no sufficient data for an accurate estimate. The tabular statement in Poor's Manual, made up from reports covering substantially the year 1880, gives the number of engines in the United States at 17,904, while those on the Canada roads foot up 1,134, making a total of 19,038. This is doubtless very nearly correct, and under the mark rather than over. The number on the roads at this time, however, or say at the close of 1881, must be very much more, as all the regular locomotive works in the country have been working all the year to their full capacity, and to the product of these works must be added the engines built in the Canada shops, and also in all the road shops. According to the Manual, there was an increase of 865 engines during the year 1880, over the number reported for 1879. It would, we think, be safe to estimate the increase for 1881 on the roads of the United States and Canada, after making due allowance for engines worn out or that have become unserviceable, at twice that of 1880, or say in round numbers 1,800. This would make the total number at this time 20,838—which of course

includes switching engines. This total may be apportioned as follows: United States 19,688, Canada, 1,200.

In examining the rolling stock estimates as given in the Manual for many years past, it appears that the excess of engines over the total number of passenger train cars, including baggage, mail and express, averages about one per cent.

#### CAR COUPLING IN CONNECTICUT.

The railroad commissioners of the State of Connecticut were to give a public hearing in Hartford, Nov. 29, upon a proposed law, requiring that all cars owned by the railroad companies of that State shall be provided with coupling apparatus which does not make it necessary for any one to go between the cars to do the coupling—such apparatus to be approved, of course, by the commissioners.

When it is considered that the existing devices contrived expressly to meet the condition named are so very numerous, and that the trouble with railroad men is in selecting the best among them, when it is so difficult to determine which is best, this movement of the Connecticut commissioners, under instructions from the general assembly of the State, is likely to attract considerable attention. We are inclined to think that neither the assembly nor the commissioners are aware of the magnitude of the task undertaken, although it is possible that the American Humane Society's experiences in the matter of cattle cars may have given them an inkling of it. A single hearing on a fixed day would amount to nothing. It would hardly suffice for taking a general and hasty view of the field, much less for making an intelligent selection of one coupler, or a dozen of them for that matter, from among a thousand. It must be admitted, however, that the case is simplified somewhat if the labors of the commissioners are confined only to that feature which obviates the necessity of going between the cars to couple or uncouple. But it would seem that this is not the case, as the instructions are to report to the next general assembly "on the whole subject of car couplings," which must of course include all the other points. These, according to a carefully prepared enumeration in a printed circular lying before us, are just sixteen; and, what is more discouraging still, a thorough practical adept in the handling of freight trains has declared very recently that for this particular service the coupling is yet to be found. We venture to predict that when it is found it will be a machine that is capable of knowing automatically just what to do and what not to do in every emergency—a contrivance that never tires, or sleeps, or gets out of order, or color-blind, or any thing else that is likely to interfere with its duties.

It is evident that the Connecticut movement has its origin mainly in humanitarian impulses—a desire to do something to lessen the dangers of car-coupling and the injuries and loss of life resulting therefrom. Whatever protection can be afforded in the way of mechanical appliances should be encouraged to the utmost; but there is an aspect of the case in which such protection is of little avail. Train hands, as a rule, are not sufficiently on the alert to protect themselves. It can hardly be supposed that railway managers desire that their employes should expose themselves to hazards that imperil life and limb in the ordinary routine of service; and even if such were the case, no train hand is compelled to take the hazard. In this respect he is a free agent. Yet it is well known that in spite of every precaution and in spite of the increasing number victimized every year, and the means and appliances in use for avoiding the necessity of going between cars, there are any quantity of train men that prefer to



do that very thing and take the chances; and they will continue to do it in spite of automatic couplers, the use of sticks, or other means of protection, until some kind of legal penalty can be brought to bear upon the practice. This, we admit, is not very practicable, and therefore the killing and maiming will go on in spite of the laudable attempt in Connecticut to mitigate the evil.

We have been shown a very ingenious and handsome device, the convenience of which will be readily appreciated by travelers in railway cars. It is a portable head-rest that can be folded into such small dimensions as to be carried in the pocket, and whenever desired can be attached to the back of a chair or ordinary car seat, affording a comfortable cushioned rest for the back of the head without necessarily removing hats or bonnets. It is made of steel, is nickel-plated, and weighs only 12 ounces. It is known as Taylor's Pocket Head-Rest, and is manufactured by The Taylor Head-Rest Co., of Chicago, Ill.

Wood and Iron is the name of a new monthly journal just started at Minneapolis, Minn., and devoted, as its name implies, to manufacturing interests, mechanical construction, railway progress, etc. The initial (December) number is attractive in its form, typography and the variety of its contents, including editorial and selected matter, and a number of contributed articles upon mechanical topics by writers of recognized ability. It contains 32 two-column pages, exclusive of cover; price \$1.00 a year. We welcome it as a valuable addition to our list of exchanges.

The Northern Pacific Railroad had an equipment of 104 locomotives, 68 passenger train cars and 3,021 freight cars on the 30th of June. Since then it has received 500 flat, 400 stock, 10 coaches and 3 sleeping cars, and is having 600 box cars built by the Michigan Car Co., 400 flats by the Peninsular Car Co., and 200 elsewhere. The shops at Brainerd, Minn., have built a large number of push and hand cars, also two derrick, 3 pile-driving, and 26 caboose cars. These latter are 28 ft. long by 8 ft. wide, and are painted bright red, which makes them very conspicuous. The priming coat is white lead with about two per cent. of red lead mixed in two-thirds oil and one-third turpentine; the second coat, oil and turpentine in equal quantities, and red lead; the third, red lead and turpentine, and the fourth red lead and oil. The inside is painted sky-blue and finished in varnish.

The road has received 22 new locomotives, and will receive twelve more during the present year. Twenty are contracted for to be delivered next year. Six Moguls and one 8-wheel engine have Wooten fire boxes, which are doing good service. Snow ploughs are now attached to the locomotives in place of the pilot. Last season Master Mechanic A. P. Farrar devised a plough and flanger, which is attached in the same way and follows the large ploughs, clearing out the ice and snow below the rail so thoroughly that the engines are able to pull full trains. By the use of these flangers last winter, the road was not blocked 24 hours at a time during all the heavy storms, and they have been run as fast as 30 miles an hour while clearing the track. Under Mr. Towne's management some remarkable car mileage was made, being an average of 45 miles a day for all freight cars, exclusive of mileage on foreign roads.

#### A New Industry in Pittsburg.

The Union Switch and Signal Company, a new industry in our city, their specialty being the manufacture of safety appliances for railways, are running their works day and night in order to keep up with their orders. They are now block signaling the Pennsylvania Railroad between Pittsburg and Walls, and between Tyrone and Spruce Creek, also

the Providence and Worcester Railroad (Mass.), and protecting all their highway crossings with electric bells. They have closed a contract with the Old Colony Road to replace the system of automatic signals which have been in use on that road for four years past with their rail system. This system is also being rapidly adopted by many of the Western and Southern railroads. In the other branches of their manufacture, such as interlocking machines, frogs, switches and switch stands, they are also crowded with orders. On the Pennsylvania R. R., at Philadelphia, they are erecting seven Saxby & Farmer interlocking machines, one of which, at 17th street, on the Filbert street extension, has 36 levers, which move 27 switches, 30 signals and 20 locks. Their automatic system of block signaling consists in the use of the rails of the track for conducting the electric current which operates the signals. The signals are connected with the track in such a manner that they will show danger when a train or part of a train is on the section, or when a switch is unlocked or misplaced, and also prevent the throwing of a switch in the face of a train, which, on entering a section, automatically locks the switch ahead of it.—Pittsburg Commercial.

The railway supply business of the late Albert Bridges will be continued by Mr. John S. Urquhart at the old stand, 46 Cortlandt street, New York. Mr. Urquhart has been connected with the house for the past 24 years, and for the past ten years has had the sole management.

THE PORTER IRON ROOFING CO., of Cincinnati, manufacture a superior quality of corrugated sheet-iron for roofs, siding, shutters, etc. The machinery used in the making of it is such that the depth of the corrugations can be regulated to provide in the best manner for expansion and contraction, and with the edges so uniform as to make perfect joints without waste of material. The material used is the best quality of charcoal iron, and the roofing is furnished either plain, painted or galvanized. The form of fastening is very simple, no tools being required except a pair of liner's snips to cut the iron, and a hammer to drive the nails.

CERRAN & WOLFF, of Chicago, have just furnished one of their excelsior lumber dryers for the Columbus (Ohio) Capital City Car Works, and are now building dryers for the Billmeyer & Small Co., York, Pa.; the Lima (O.) Car Works; the New York, Ontario & Western; Chicago, Burlington & Quincy; and Burlington & Missouri roads; and have also contracted for two dryers with the Louisville & Nashville road.

THE PENFIELD BLOCK CO., of Lockport, N. Y., employ about 100 men, and have greatly increased their facilities in the manufacture of wood and improved wrought-iron pulley blocks, steel roller and phosphor bronze self-lubricating bronze bushings, warehouse and baggage trucks, and other specialties, including the Giant Car Pusher, a very ingenious device for moving cars by hand, and of which they are the sole manufacturers. The company has issued a new illustrated catalogue, which will be mailed on application.

### Our Directory.

We note the following changes since our last issue. Readers are requested to give us prompt notice of changes when they occur:

**Baltimore & Potomac.**—Mr. A. O. Dayton is Superintendent of Motive Power of the Baltimore & Potomac and Alexandria & Fredericksburg Railroads, with office at Baltimore, Md.

**Canadian Pacific.**—Mr. W. R. Baker, Local Treasurer of the Western Division, has been appointed also Purchasing Agent. His office is at Winnipeg, Manitoba.

**Chicago, Burlington & Quincy.**—Mr. H. B. Stone, Superintendent of Motive Power and Machinery, has been appointed General Superintendent. Mr. A. Forsyth has been appointed Master Mechanic of the St. L. & R. I. Division, vice L. E. Johnson, transferred to Chicago Division.

**Chicago & Grand Trunk.**—Mr. Herbert Roberts is appointed Mechanical Superintendent, with office at Ft. Gratiot, Mich.

**Chicago & Northwestern.**—Mr. E. J. Cuyler has resigned his position of Superintendent of the Milwaukee & Wisconsin divisions.

**Cincinnati, New Orleans & Texas Pacific.**—This company is the lessee of the Cincinnati Southern road. Mr. John Scott is General Manager and Jas. Muehan General Master Mechanic, with offices at Cincinnati, Ohio.

**Cleveland, Tuscarawas Valley & Wheeling.**—Mr.

Wm. Thornburg is appointed Superintendent. He was recently on the Ohio Central road.

**Illinois Midland.**—Mr. E. D. Frost is appointed General Superintendent, with office in Terre Haute, Ind.

**Indianapolis & St. Louis.**—Mr. T. W. Ranson, late of the Cleveland, Tuscarawas Valley & Wheeling road, has been appointed Master Mechanic, vice A. J. Sanborn, resigned.

**Little Rock, Mississippi River & Texas.**—Mr. Frank F. Hufsmith is appointed Master Mechanic, with office in Arkansas City, Ark., in place of Mr. Joseph Taylor, resigned.

**Louisville & Nashville.**—Mr. Morris S. Belknap has been appointed Superintendent of the Mobile & Montgomery Division, Selma Division, Western Railroad of Alabama, and Pine Apple Division of Pensacola & Seina Railroad, with headquarters at Montgomery, Ala.

**Missouri Pacific.**—Mr. J. M. Eddy is appointed Superintendent of the Missouri, Kansas & Texas Division, with office in Sedalia, Mo.

**New York Central & Hudson River.**—Mr. A. Gould, of Buffalo, previously assistant Master Mechanic of the Western Division, has been appointed Master Mechanic of the entire road in place of Mr. Henry Watkeys, resigned. Mr. Gould will retain his office in Buffalo.

**New York, Lake Erie & Western.**—Mr. W. B. Coffin is appointed Superintendent of the Western Division (Hornellville to Dunkirk), in place of Mr. John S. Beggs.

**Pennsylvania Company.**—Mr. Joseph Wood is appointed Superintendent of Motive Power for the line operated by this company. Office at Fort Wayne, Ind.

**Pennsylvania.**—Mr. James Bohn, for the past 15 years Master Mechanic of the Pittsburg, Ft. Wayne & Chicago Division, has resigned his position. The office of master mechanic will be abolished and the duties be performed by a "superintendent of shops." Mr. Geo. S. Griscom, Superintendent of the Eastern Division, has resigned.

**Pittsburg, Ft. Wayne & Chicago.**—Mr. C. D. Law has been appointed Superintendent of the Western Division, in place of Charles D. Gorham, resigned.

**Pittsburg & Western.**—Mr. W. L. Hefeker is appointed Master Mechanic, with office in Zelienople, Pa.

**Seaside & Memphis.**—The name of this road has been changed to Columbus & Western. Offices at Columbus, Ga.

**Utah & Delaware.**—Mr. George Koykendall has resigned the position of Superintendent, and will engage in other business.

**Virginia Midland.**—Mr. W. M. S. Dunn has been appointed Superintendent in place of Peyton Randolph, resigned.

**Wabash St. Louis & Pacific.**—The Cairo & Vincennes, the Danville & Southwestern and the St. Francisville & Lawrenceville roads, recently purchased, will be known as the Cairo Division. Mr. Geo. Skinner, formerly of the Peoria, Pekin & Jacksonville road, is Superintendent. Mr. Arthur A. Hebart has been appointed Superintendent of Chicago Division.

WANTED.—A situation as stenographer and typewriter, by a young man who is also a practical machinist, having 13 years' experience in railroad shops. Can furnish first-class references. Address STENOGRAPHER, 60 East Schuyler street, Oswego, N. Y.

**EMERSON FILE BINDERS.**—We have a special lot of these Binders made for the CAR-BUILDER, which will be furnished to our subscribers by mail, postage prepaid, at the regular price of \$1 each; and to those who can get them at our office, at 75 cents each. They are bound in half muslin and cloth. We will also furnish one Binder to any old subscriber who will send us before January, 1882, a new subscriber for one year—the binder to be sent by mail to those who remit 25 cents (for expense of mailing) with new subscriber. We will also furnish one Binder by mail, postage prepaid, to any old subscriber who will send us before January, 1882, two new subscribers for one year.

NATIONAL CAR-BUILDER, 5 Day Street.

### CONTINUOUS DRAW-BAR PATENTS.

The following circular has been issued by the Secretary of the Western Railroad Association: CHICAGO, Sept. 9, 1880.

To the Members of the Association: GENTLEMEN: Claims have been pending for several years that the Continuous Draw-Bar sold by the Continuous Draw-Bar Company under the Middleton and the Griffin and Paterson patents is an infringement of the patent of Edward L. Caim.

This Association has continuously advised against entertaining this claim, but to quiet all questions, and at our instigation, the Continuous Draw-Bar Company has recently purchased the Caim patent, its owners inserting in the assignment a full and absolute release to all the members of the Eastern and Western Railroad Associations from any and all liability for, or on account of, any infringement heretofore of said patent.

Yours truly, J. H. RAYMOND, Secretary, etc.



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PENNSYLVANIA CO., Wm. Mullins, General Purchasing Agent, Pittsburg, Pa.  
BALTIMORE & OHIO RAILROAD CO., N. S. Hill, Purchasing Agent, Baltimore Md.  
CHICAGO & ALTON RAILROAD CO., A. V. Hartwell, Purchasing Agent, Chicago, Ill.  
CHICAGO & NORTHWESTERN RAILROAD CO., R. W. Hamer, Purchasing Agent, Chicago, Ill.  
LEHIGH VALLEY RAILROAD CO., L. Chamberlin, Purchasing Agent, Philadelphia, Pa.  
NORTHERN RAILROAD OF CANADA, F. W. Cumberland, Superintendent, Toronto, Ont.  
SAUGATUCK RAILROAD CO., G. W. Beach, Superintendent, Waterbury, Conn.  
PHILADELPHIA, WILMINGTON & BALTIMORE RAILROAD CO., S. A. Hodgman, Superintendent of Motive Power, Wilmington, Del.  
NEW YORK, NEW HAVEN & HARTFORD RAILROAD CO., R. N. Dowd, Commissary, New Haven, Conn.

UNION PACIFIC RAILROAD CO., A. D. Clark, Purchasing Agent, Omaha, Neb.  
KANSAS CHICAGO, BURLINGTON & QUINCY RAILROAD CO., Wm. Irving, Purchasing Agent, Chicago, Ill.  
LOUISVILLE, CINCINNATI & LEXINGTON RAILROAD CO., Wm. Mahl, Purchasing Agent, Louisville, Ky.  
GRAND TRUNK RAILWAY N. Wall, Port Huron, Mich.  
LITTLE ROCK & FORT SMITH RAILROAD CO., T. Hartman, Purchasing Agent, Little Rock, Ark.  
GILBERT & BUSH CO., Troy, N. Y.  
WASON MANUFACTURING CO., Brightwood, Mass.  
BILMEYER & SMALL MANUFACTURING CO., York, Pa.  
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Very respectfully,

JOHN W. MASURY & SON, New York and Chicago.

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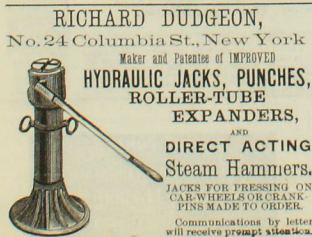
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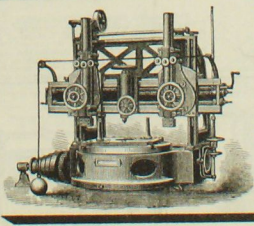
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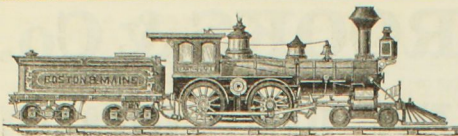
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### BAR PATENTS.

issued by the Secretary of  
the Treasury, Sept. 9, 1880.  
pending for several years  
for the Comptroller of the  
Treasury and the Secretary  
of the Treasury, Sept. 9, 1880.  
of patent 71,580, granted  
1880, granted 10th February,  
1881.  
considered advised against  
in all questions, and at our  
request, the Secretary of the  
Treasury has recently  
advised inserting in the  
Circular to all the members of  
the Association from which  
any infringement knowledge  
may be obtained.  
H. W. Brown, Secretary, etc.



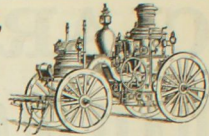


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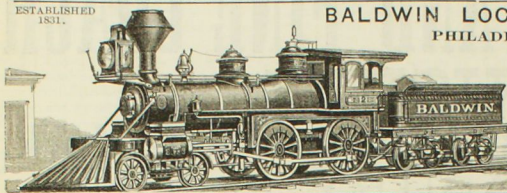
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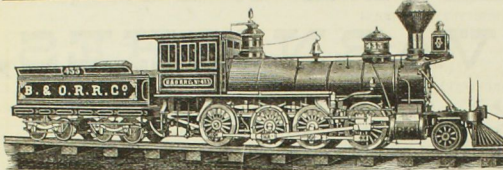
Adapted to every variety of service, and built accurately to standard gauges and templates. Like parts of different engines of same class perfectly interchangeable. Passenger and Freight Locomotives, Mine Locomotives, Narrow Gauge Locomotives, Steam Street Cars, etc. Illustrated Catalogues furnished on application of customers. All work thoroughly guaranteed.

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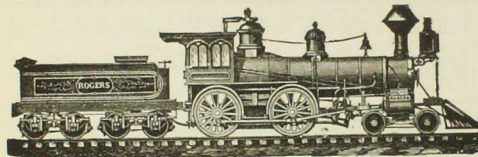
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R. S. HUGHES, Secretary. } W. M. S. HUDSON, Supt.

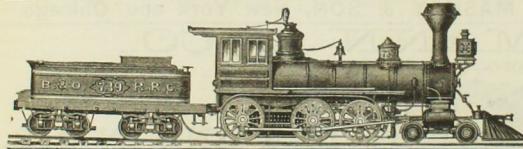
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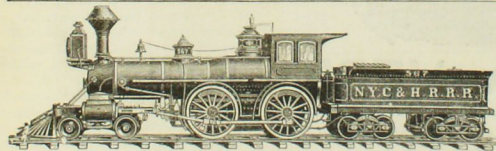
D. A. Stewart, Pres. D. A. Wightman, Supt. Wilson Miller, Sec. & Treas.



### SCHENECTADY

### LOCOMOTIVE WORKS.

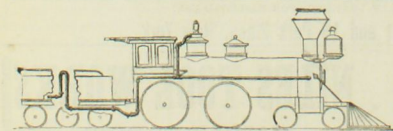
CHAS. G. ELLIS, President. EDWARD ELLIS, Treasurer.  
WALTER McQUEEN, Vice-President.



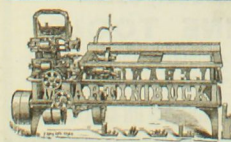
SCHENECTADY, N. Y.

### THE ASHTON VALVE CO.,

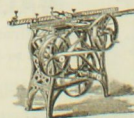
271 Franklin Street, Boston, Mass.



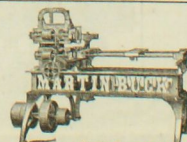
The Ashton Blowback Safety-valve is constructed so as to conduct the escape steam which is blown off back to the tender, or to the smoke-box and up the chimney. By this arrangement the heat of the escape steam, instead of being wasted as it is when an ordinary safety valve blows off, is communicated to the cold water in the tender. This not only results in an important economy, but it renders the escaping steam harmless, and the increase of temperature of the water has a tendency to deposit some of its impurities before it is pumped into the boiler. It thus stops the use of "safety" and all engine steam better and faster, and do more effective work with these valves than with those in ordinary use.



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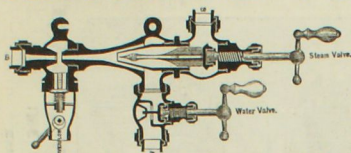




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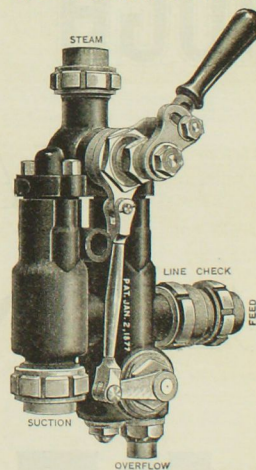
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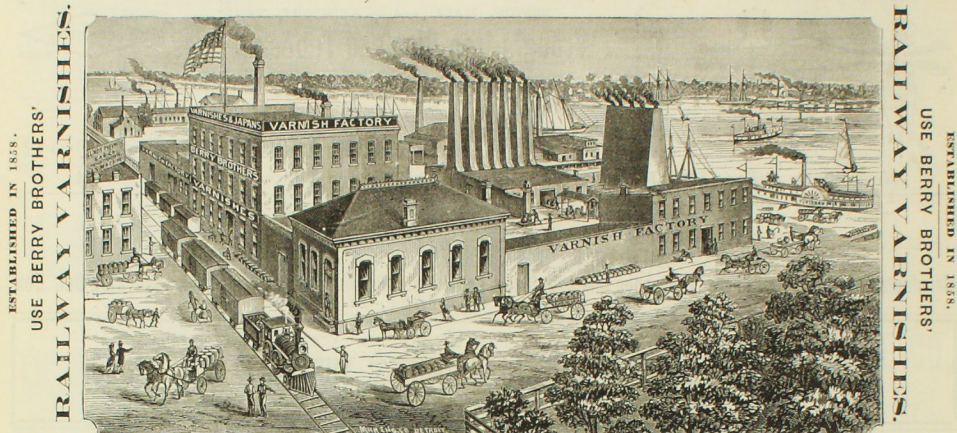
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1

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IN THE  
PATENT FIGHT  
BETWEEN  
D. A. HOPKINS, of 113 Liberty St., N. Y.  
PATENTEE AND MANUFACTURER OF  
SELF-FITTING JOURNAL BEARINGS  
AND  
T. V. LE ROY,  
A SECOND DECISION WAS RENDERED JUNE 7, 1881.  
IN FAVOR OF HOPKINS.

The closing paragraphs of said decision read as follows:

"As the proofs stand, therefore, Hopkins was the first to conceive, the first to disclose to others, the first to embody in models, the first to reduce to practice, and the first to apply for a patent. Le Roy was first to obtain a patent, but under circumstances which do not give him the prima facie case which a patent usually implies."

"We must find priority of invention to be with D. A. Hopkins, and affirm the examiner's decision."

H. H. BATES,  
R. L. B. CLARKE,  
R. G. DYRENFORTH,  
Examiners-in-Chief.

A pretended report of an interview with myself, relative to the above matter, published last month in a new-fledged railroad paper, is thoroughly misleading and almost wholly false.

D. A. HOPKINS.



REFERENCES.—\* General Manager, † General Superintendent, ‡ Assistant General Superintendent, § Assistant Superintendent, \*\* Superintendent of Transportation, §§ Assistant General Manager.

REFERENCES.—\* General Manager, † General Superintendent, ‡ Assistant General Superintendent, § Assistant Superintendent, \*\* Superintendent of Transportation, §§ Assistant General Manager.

[illegible]



This image shows a vertical strip of a book's endpaper. The left side is a light cream or off-white color, while the right side is a dark, almost black, textured area. The transition between the two is a sharp vertical line. There are some faint, illegible markings on the left side, possibly from the reverse side of the page or from the binding process.

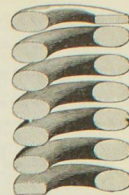




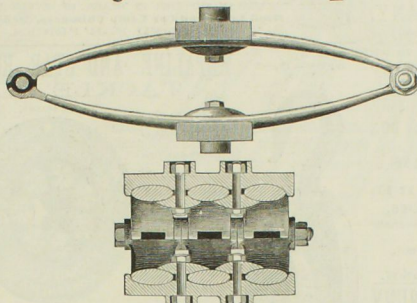


## MANUFACTURERS OF

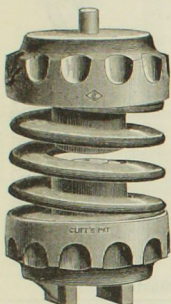
**CLIFF BUFFER.**  
5¼ by 8. 2¼-in. hole  
Capacity, 18,500 lbs.



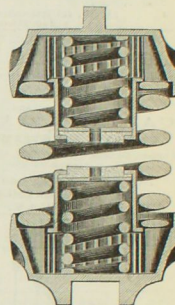
*Sectional.*  
CLIFF BUFFER.  
5¼ x 8. 2¼-in. hole  
Capacity, 16,500 lbs



ACME TRIPLET FREIGHT ELLIPTIC.  
CLIFF'S PATENT, MARCH 29, 1881.  
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7½ in. diam., 11¼ in. high.  
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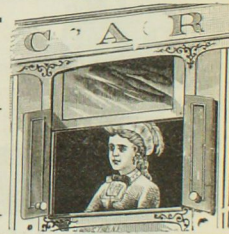
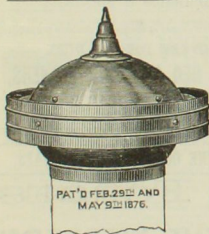
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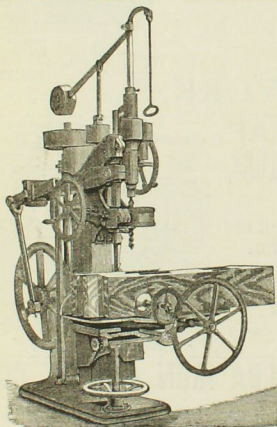
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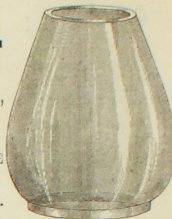
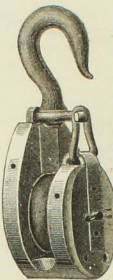
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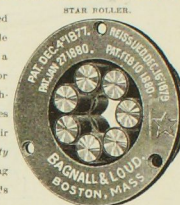
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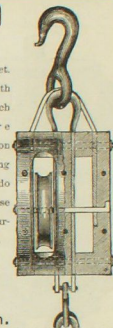
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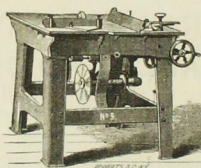


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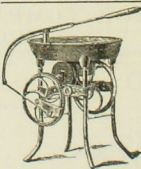
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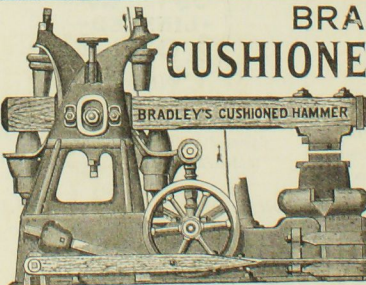
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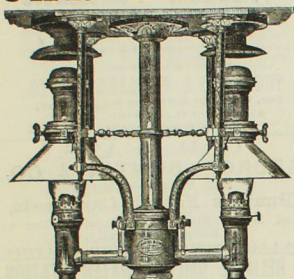
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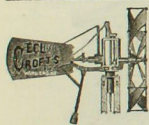
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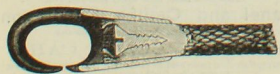
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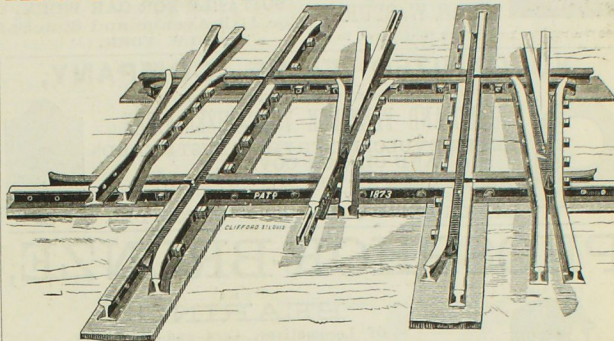


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GENERAL AGENT.**THE WESTINGHOUSE AIR-BRAKE COMPANY,**

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MANUFACTURERS OF THE

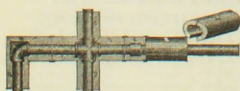
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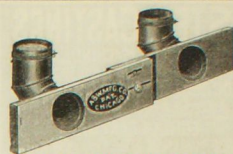
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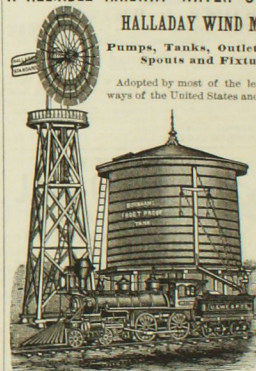
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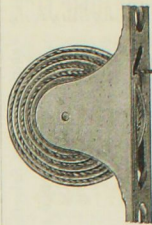
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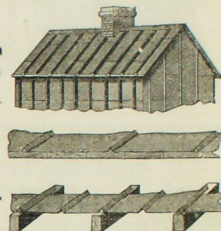
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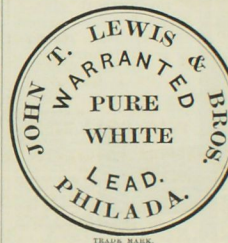
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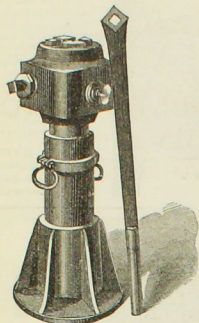
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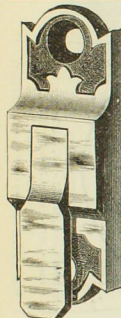


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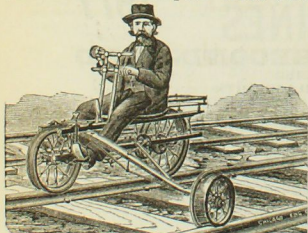
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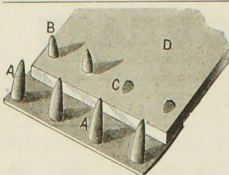
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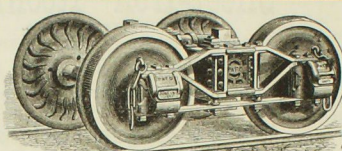
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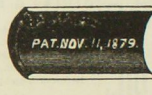
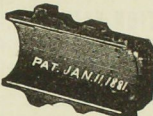
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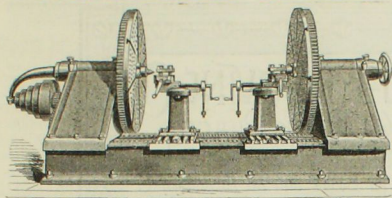
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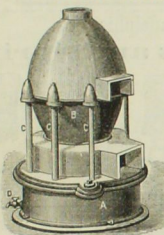
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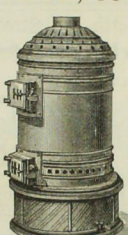
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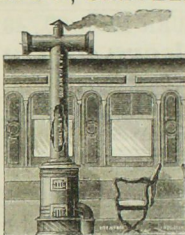
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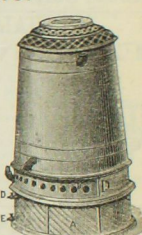
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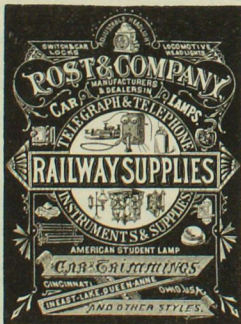
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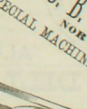
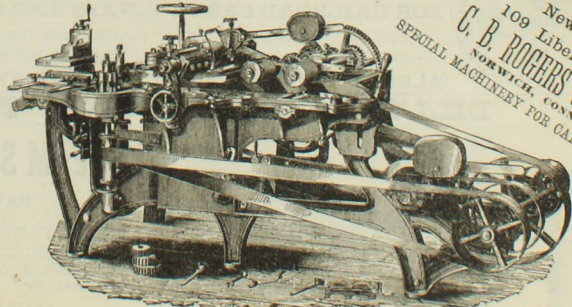
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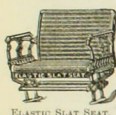
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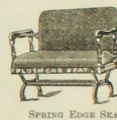
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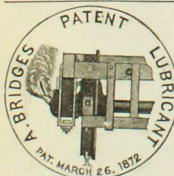
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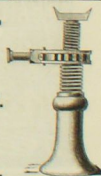
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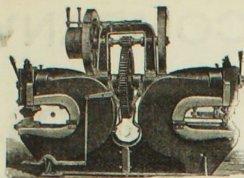
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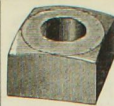


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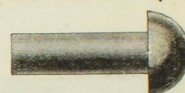
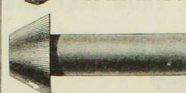
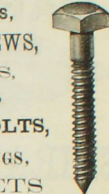
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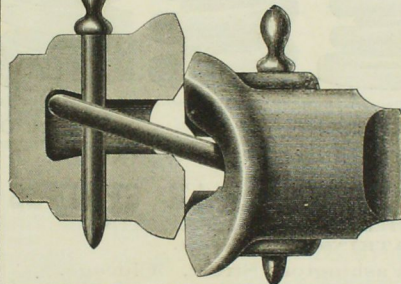
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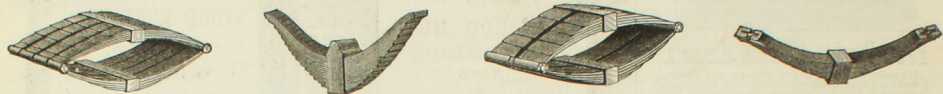
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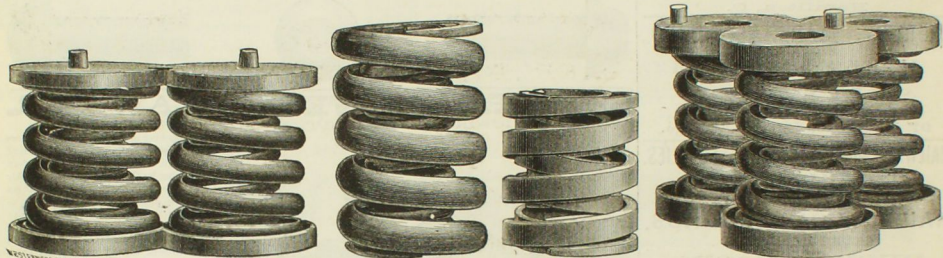
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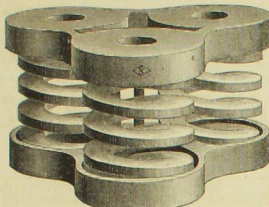


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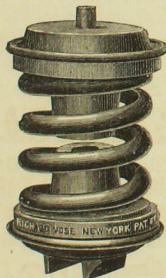
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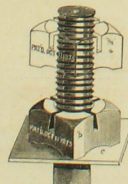
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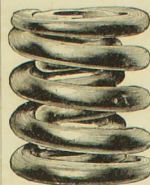
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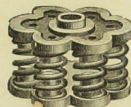
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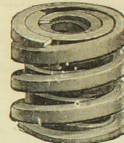
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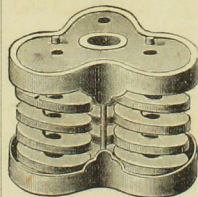
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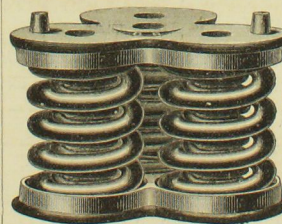


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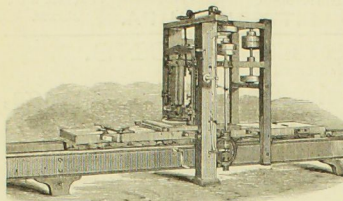
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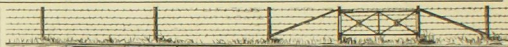
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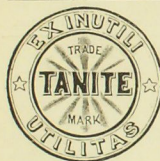
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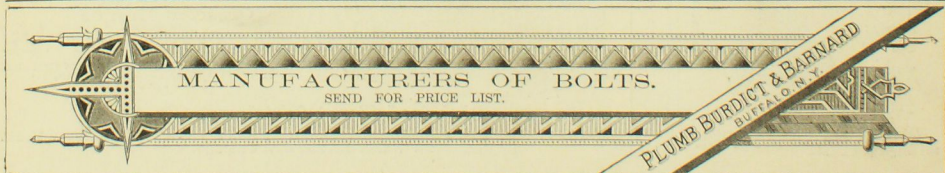
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